MAR 19 1943

The OIL AND GAS JOURNAL

MERITORIOUS ACT OF EXTRAORDINARY FIDELITY OR ESSENTIAL SERVICE"

The oldest American Army decoration, the Purple Heart, was established in 1782 by General George Washington. Intended as a permanent award for persons "who, while serving in the Army of the United States, perform any singularly meritorious act of extraordinary fidelity or essential service," the Purple Heart fell into disuse after the War for Independence. It was not until Feb. 22, 1932 (200th anniversary of Washington's birthday), that it was revived, with the same designation for its award.

Late in 1942 the War Department announced that the Purple Heart would hereafter be awarded to the nearest of kin of military or civilian personnel who, while serving in any capacity with the Army of the United States, die as a result of enemy action.

In addition, it is to be awarded to those wounded in action or as a result of an act of the enemy, provided such wounds require medical treatment.

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Below: Ribbon which may be worn in lieu of the Medal

MARCH 18, 1943

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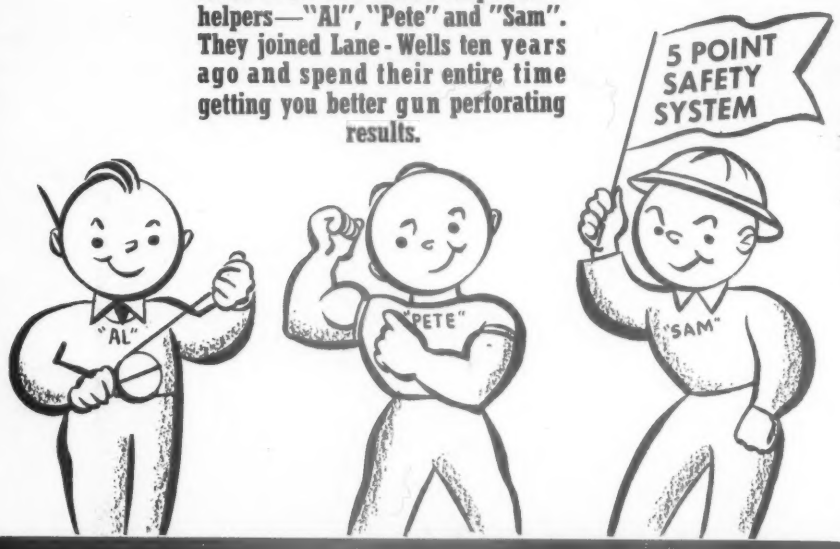

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Table of Contents

NEWS DEVELOPMENTS

Impact of Venezuelan Oil Law May Blanket Hemisphere ... 24
How Agreement Was Reached ... 25
New Regulations Coming on Petroleum Equipment ... 26
PAW Issuing CMP Certificates ... 26
Petroleum Section of ODT Is Expanded ... 28
Tanker Replacements More Than Equal Submarine Sinkings ... 29
Many Joint-Facility Uses Already Effected in District 2 ... 32
OPA Studying Refinery Costs ... 33
Summary of Current Tire Rules ... 34
Improved Yields From TCC Process ... 36
Gas Industry Coordinates Research at New Institute ... 37
Unit Operation Recommended by National Resources Board ... 39

Trends ... 23
This Week ... 27
State Capitals ... 30
Editorial ... 31
Federal Order Digest ... 35
Deaths ... 40
Natural-Gas News ... 81
Natural-Gasoline News ... 81
Refining News ... 84
Pipe-Line News ... 86

ENGINEERING—OPERATING

Corrosion Problems in Western Kansas ... 41
Slim-Hole Drilling in West Texas ... 48
Progress in Metals ... 56
Factors Affecting Expansion of Kansas Water Flooding ... 62
Reconditioning Used Equipment by Metal Coating ... 65

Plant Practices ... 44
Operating Ideas ... 73
Cost Engineering ... 75
Eng. Fundamentals ... 79

EXPLORATION AND DRILLING

Week's Highlights ... 89
Completions in All Fields ... 89
Daily Average Production for Week ... 90
Completions Show Further Decline in February ... 105

ADDITIONAL FEATURES

Drilling Contractors ... 106
Personals ... 109
Market Developments ... 112
Refinery Prices ... 113
Equipment Progress ... 115
Classified Advertising ... 117
Calendar of Events ... 120
Advertisers' Index ... 120

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...it's OUR JOB to Find it!

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GEOPHYSICAL SERVICE INC.

DALLAS, TEXAS

the OIL AND GAS JOURNAL

Trends

Crude-Oil Production
By States — Page 90

CRUDE PRODUCTION 3,878,180 bbl. daily average—down 28,550 bbl. One year ago 3,526,580 bbl.

CRUDE STOCKS 235,686,000 bbl. as of March 6 — up 469,000 bbl. One year ago 260,064,000 bbl.

GASOLINE STOCKS 92,845,000 bbl. as of March 6—down 312,000 bbl. One year ago 108,997,000 bbl.

RESIDUAL FUEL-OIL STOCKS 68,782,000 bbl. as of March 6—down 1,358,000. One year ago 86,669,000.

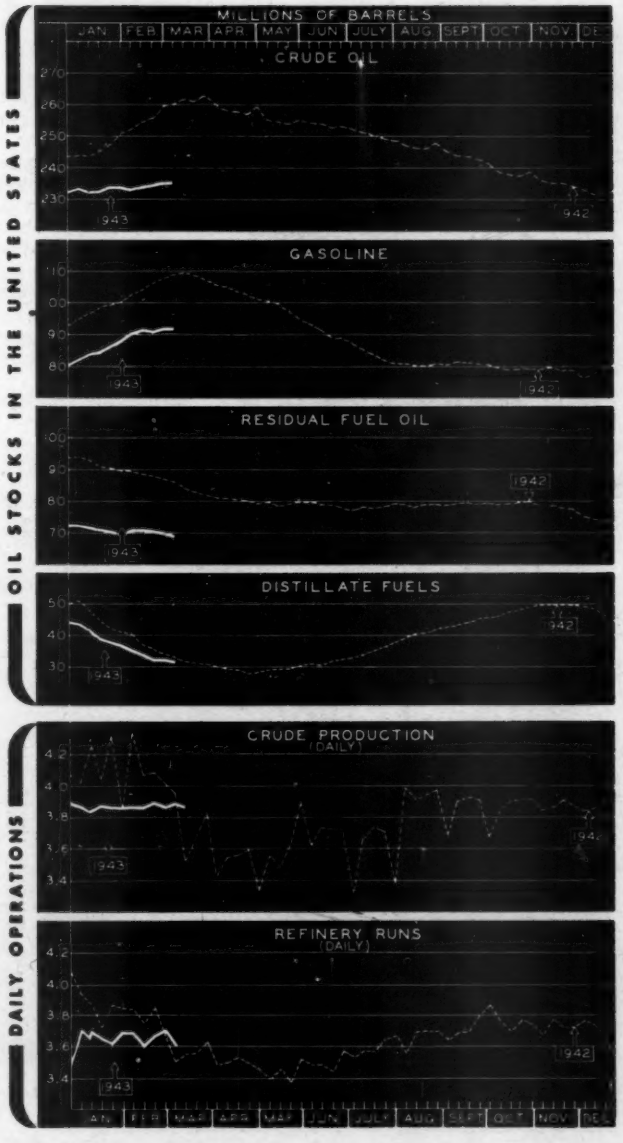
GAS OIL AND DISTILLATES 31,668,000 bbl. as of March 6—down 1,271,000. One year ago 32,742,000.

REFINERY RUNS 3,626,000 bbl. daily week ended March 6—down 83,000. One year ago 3,520,000 bbl.
Refinery report delayed.

THIS page last week reflected the views of many operators that a decision was in the offing in regard to the petroleum industry's requests for higher prices for crude oil. An evaluation of the information that has come out of Washington over the past week relative to this matter, while not dealing specifically with this subject, does not point to favorable action in the immediate future. It is apparent that certain representatives of the Office of Price Administration are not thinking in terms of generally higher prices for crude oils. Selective advances to encourage the production of certain crudes or to cover exceptionally high costs in settled areas are again being suggested by OPA analysts who continue to point to the recent report of the U. S. Tariff Commission as proof that general price advances in the production of the petroleum industry's raw materials are not needed. These various contentions had previously been answered in memoranda prepared by industry representatives.

IT IS also said that the pricing authorities, with some support from PAW officials whose duties are connected with the discovery of new reserves, favor a subsidy plan in which the Government would finance exploratory operations whenever it was considered expedient to further the war need of expanding proven reserves. This program would be preceded by a pooling of geological information of private companies with new exploratory work, as a basis for approval of actual wildcat drilling. The OPA contention in this situation as originally expressed months ago is that the subsidy is a more economical method of stimulating the search for more oil than a general advance in crude-price schedules would be. It is apparent that if a serious effort is ever made to make such a program of exploratory operations effective, it will be bitterly opposed by the great majority of operators.

PRODUCERS could point to the latest monthly review of the Department of Labor in further support of their contentions for immediate action on prices for their product. The latest index on wholesale prices shows petroleum and products at 60.7, by far the lowest of any of the major commodities with practically no advance since this country's entry into the war. In contrast there have been advances in all other commodities with foods at 104.3, building materials 110.1 and all commodities, 101.



Impact of Venezuelan Oil Law May Blanket Western Hemisphere

RATIFICATION of the new Venezuelan petroleum law at Caracas last week provides for revolutionary changes in the status of private oil companies operating in that South American country. Provisions of the new law, chiefly aimed at increasing the government's revenues from various phases of operations, probably will have a long-term impact on all postwar petroleum affairs in the Western Hemisphere and Western Europe.

None of the broader implications are mentioned specifically in the new law which was ratified March 13 by the Venezuelan Congress after all details had been accepted both by representatives of the oil companies and of the government. But reports are current in international petroleum circles that the companies have been given reasonable assurances that higher production from Venezuela will be arranged. Plans, it is understood, provide for protected shipping lanes in the Caribbean and from that ocean to consuming centers under the control of the United Nations.

There is no assurance when all phases of the plan for drawing more heavily on Venezuelan fields can be brought to fruition. Progress of the war will be the determining factor, involving principally success of anti-submarine warfare, scope of the sea-lane patrols and available tanker transportation.

One concrete objective disclosed by the new law is creation of a substantial refining industry in Venezuela within 5 years after the war ends. Venezuela's refining capacity will be raised to 192,000 bbl. per day, including 40,000 bbl., to which some companies are already committed, within the 5-year period. Present refining facilities will handle 72,000 bbl. daily, meaning that a minimum of 120,000 bbl. of new capacity must be provided in the immediate postwar era.

Seven Principal Changes Made

THERE are seven principal changes in the Venezuelan petroleum law which is based on the 1936 statute, modified to cover desires of the government and companies (see p. 30, The Oil and Gas Journal, Feb. 18, 1943). Principal changes are:

1. Pipe lines become common carriers.

2. Tax on production is increased to 16⅔ per cent, but the companies are no longer required to deliver the government's share of the oil at a sea port free of cost.

3. Surface taxes are increased on a sliding scale from 5 bolivars ($1.60) per hectare (2.471 acres), annually, for the first 10 years, to 30 bolivars annually per hectare for the last 10 years of the 40-year concessions. However, each concessionaire receives credit for the full amount of any production tax paid during the year to offset any surface tax in excess of 5 bolivares per hectare due from him that year. Thus, only the concessionaire who fails to develop his holdings is called upon to pay the high surface taxes.

4. Companies are no longer to enjoy exemption from all import duties but the government is authorized to suspend such duties on equipment imported for the construction of new plants.

5. Companies are granted the right, hitherto denied them, to explore public lands outside their concessions by geological and geophysical methods.

6. Concessions are to run for 40 years and the holders have a preferential right to an extension.

7. Concessions granted under prior laws may be converted to the terms of the new law, thereby giving to their owners a new period of 40 years in which to develop.

OWI Photo

Tanker traffic between this country and South America is virtually certain to rise, probably during the war, certainly after its conclusion

Chief Advantages Gained By Operating Companies

CHIEF advantage accruing to the companies under the new law is provision for concession to run 40 years and for converting existing concessions to this longer term.

C. H. Lieb, New York, president of Creole Petroleum Corp. and Lago Petroleum Corp., two Venezuela operating affiliates of Standard Oil Co.

(New Jersey) analyzed principal changes in a special letter distributed last week to stockholders.

"The principal new burden imposed on the companies by the revised law," Mr. Lieb reported, "is the increase in royalty or production tax. Under former laws, this tax varied from 7½ per cent to 15 per cent of the value of the oil produced, averaging between 10 and 11 per cent. The new royalty or tax will be 16⅔ per cent, or one-sixth.

Difference in Royalty Laws

"It should be understood," he pointed out, "that the usual conception of oil royalties in the United States does not fit Venezuela where, since the government is both landowner and taxing authority, the 16⅔ per cent royalty is viewed as a production tax. In the United States the total of the commonly stipulated royalty of 12½ per cent to the landowner, plus the usual production tax to the state, may exceed the new Venezuelan production tax.

"The most important advantage the companies will obtain under the new law is the extension of the term of old producing concessions to 40 years from the date of conversion to the new law. The term remaining under its existing concessions will not permit your company economically to recover in the future the petroleum reserves it has already developed—much less reserves which might be discovered in the future on its still unexplored concessions. The new term of 40 years, together with the preferential right to an extension, will permit your company to plan its operations so as to produce the reserves in the most economical manner and to recover the maximum amount of oil.

"Another result of the negotiations which is important to the companies is the recognition by the Venezuelan Government of the principle of mutual interest in the development of government resources by private investors, the adoption of a long-range policy of cooperation and guaranty of the right of private operation in the petroleum industry.

"The increase in cost to the companies on account of the higher taxes will depend upon the volume produced and upon the degree to which other costs may be reduced as a result of better planning made possible by the new law. Our judgment is that your company's best interest will be served by taking out new concessions under the proposed law and we have advised the Venezuelan Government of our intention to do so. Most other companies operating in Venezuela have reached the same conclusions and taken the same action.

"Your directors have under consideration a proposal for consolidating the properties and operations of Creole Petroleum Corp., with those of Lago which is permissible under the proposed law. Such consolidation, we believe, would be in the best interest of both companies. It would broaden their scope and make possible increased efficiency of operation."

How Agreement Was Reached

DR. GUSTAVO MANRIQUE PACANINS, attorney general, carried on much of the preliminary negotiation with oil companies and the U. S. State Department which entered the discussions early last summer.

The State Department, officially advised that the Venezuelan Government was determined to obtain a greater financial return from the operation of its petroleum economy, that it did not intend to expropriate private properties but that it had other adequate legal means to accomplish its purpose, felt that a real problem was involved and suggested to the companies that it would be wise to reopen negotiations with Venezuelan officials in a cooperative spirit.

Preliminary discussions were held in New York and Washington in September and October 1942, between the attorney general of Venezuela and the company representatives. At that stage, Venezuela retained Herbert Hoover, Jr., and A. A. Curtice, president and vice president, respectively, of United Geophysical Co., as technical advisers for the government. Discussions between the company representatives and the technical advisers proceeded from the end of October to January after which the law was drafted, submitted to interested parties for approval and finally ratified last week at Caracas.

Principal producing companies in Venezuela are subsidiaries and affiliates of Standard Oil Co. (New Jersey), Gulf Oil Corp., Royal Dutch-Shell and Consolidated Oil Corp. Other companies with production include Pantepec Oil Co. of Venezuela, Texas Co., Ltd., and Socony-Vacuum Oil Co., C.A.

Government Revenue to Rise About 80 Per Cent

AS an example of how the higher production tax will apply, President Medina said last week that 1942 revenues under the previous petroleum law were 63,561,411 bolivars ($20,339,651) and would have been 114,237,081 bolivars ($36,555,865), an increase of 80 per cent, if the new law had been in effect. He estimated that the 1943 revenue will be about 50,000,000 bolivars ($16,000,000) higher under the new law.

Another concession made by the oil companies in working out details of the new law was to settle past claims of the government totaling 25,235,572 bolivars ($8,075,383) of which 10,309,634 bolivars had been paid under technical protest.

Pipe-line owners, the new law provides, "are obligated to transport when their installations have the capacity to do so, the substances extracted by other concessionaires without discrimination and at a reasonable price." The minimum price of oil in the field from which the new tax may be computed ranges from 13.2 bolivars per cubic meter for less than 18 A.P.I. gravity crude to 22.95 bolivars for 42 gravity and higher, approximately 59 cents to $1.06 per barrel.

NEXT WEEK--ANNUAL REFINERY NUMBER

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- **Added features:**
- **An 80-page Buyers' Guide of great value to those connected with refinery construction and operation and others seeking products and equipment.**
- **Annual survey of petroleum refineries in United States and Canada.**

New Regulations Coming on Petroleum Equipment

WASHINGTON, D. C.—New regulations governing the acquisition and use of materials by the oil industry are being prepared by the Petroleum Administration for War to go into effect April 1 when the Controlled Materials Plan begins to operate, but present indications are that these regulations will not be issued and in the hands of the industry much before their effective date.

The new regulations are complete revisions of the present orders P-98-b and P-98-c, the first covering acquisition of new materials and the second the use and resale within the industry of inventories and second-hand equipment.

The PAW is perfecting its internal machinery for handling CMP applications and is already issuing some CMP certificates, and has sent preliminary instructions to oil and gas operators regarding the operation of the new plan, even though the regulations themselves are still in the drafting stage. It is understood that the new regulations will be relatively simple from the standpoint of oil operators, although the method of handling CMP applications between PAW and the War Production Board is rather involved.

Meanwhile PAW is urging all operators to place orders and applications for materials as promptly as possible. In a memorandum to all district directors of materials, Assistant Deputy Administrator Robert E. Allen said:

"Because of limited number of CMP 4 applications being received for deliveries of equipment and materials for second and third quarters, it seems apparent that petroleum operators do not realize the necessity of filing their applications if they expect to have their supplies scheduled for manufacture and delivery by the mills. Because of the 90 days or more required for tubular goods and many other items of petroleum equipment it would be well for you to urge operators to prepare and file at once the requisite CMP 4 applications for the projects they contemplate during the second and third quarters if long delays due to capacity-mill schedules are to be avoided. The acquisition of material under the provisions of CMP Regulation 1, is of course separate and apart from the use of such material under M-68 series' orders or successor orders which deal with the efficient use of material whether purchased or removed from stock. It is urged, therefore, that all operators who contemplate drilling wells, laying pipe lines, building gasoline plants, refineries or other facilities should immediately file with the Petroleum Administration their application for allotment of the materials they need for other purposes than maintenance, repair and operation supplies, so that an allotment of such required materials may be made to each operator in time to obtain delivery during June and the third quarter"

In his March 1, 1943, report to the production committee of the PIWC, Don R. Knowlton, PAW director of production, made this comment about the use of materials in the production branch of the industry:

"Data assembled in this office indicate that the material authorized for purchase by the production branch of the industry is falling considerably short of the quantity of material allotted to the production branch for the last quarter of 1942 and the first quarter of 1943. This situation probably results from the fact that the industry has been operating to some extent on a backlog of material in inventory.

"While it is imperative that the industry liquidate surplus stocks, now defined as material in excess of a 90-day supply, before acquiring new material, it is equally important that adequate working inventories be maintained. Operators should guard against excessive depletion of their stocks, as such depletion may seriously hamper their drilling operations and thus adversely affect the over-all 1943 drilling program. Under existing regulations, operators are permitted to secure material to maintain minimum inventories and within this limit should endeavor to maintain adequate stocks to facilitate their operations."

PAW Issuing CMP Certificates

WASHINGTON, D. C. — The Petroleum Administration for War is now beginning to issue certificates for the purchase of "controlled materials" under the new priorities procedure of the Controlled Materials Plan.

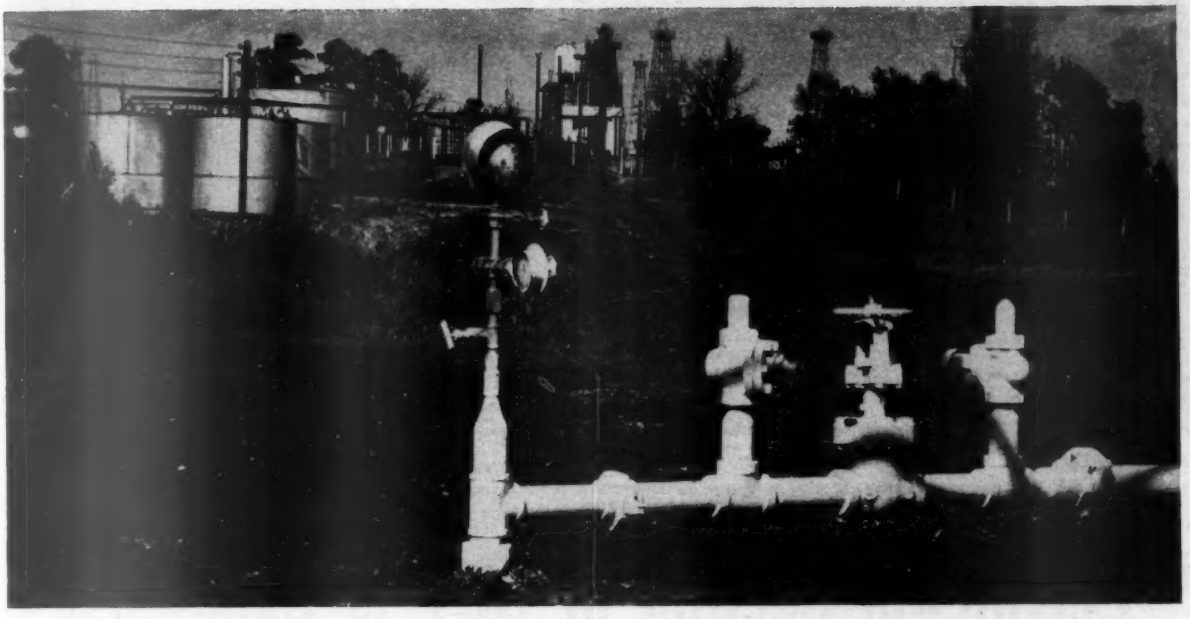
In general, the procedure for operators in the oil and natural-gas industries remains about the same as before. Applications for priorities continue to be made to PAW or to the district offices for new drilling, for maintenance and repair, or for big projects. The CMP applies to steel, copper and aluminum, while other materials are obtained under the old priorities system. As one of the several "claimant agencies" under CMP, PAW has already received from the WPB requirements committee an allocation of controlled materials for the second quarter of 1943, and the certificates it issues to operators will be similar to checks drawn against a bank deposit. These allocations have not been made public, but they were based on PAW estimates of the amount of materials required for anticipated drilling during the quarter, normal replacements for maintenance and repair, and refinery, pipe line, and other projects scheduled.

Oil operators who have not yet applied for materials they expect to use during the next quarter should do so at once, and as soon as certificates are received they should place their orders with supply houses, indicating desired time of delivery. This will permit supply houses and manufacturers to schedule their production of equipment and supplies evenly during the quarter.

The general procedure for operating under CMP is laid down by a series of CMP regulations issued by the War Production Board and applying to all industries regardless of which claimant agency processes their applications. The oil industry priority order, P-98-b, still applies to PAW procedure, but this is in process of revision and is expected to be reissued in a new form in the near future.

PAW officials intend to make a detailed explanation of the new materials control system as soon as the new P-98-b order is issued, but in the meantime they have prepared two documents to aid in shifting over to CMP operations. One of these, intended primarily for intraoffice use by officials handling CMP forms, is a 13-page memorandum on the use of allotment numbers, and gives the code numbers used by PAW to identify the nature of each certificate.

In addition, F. A. Watts, director of materials, has sent a six-page letter to all operators in the industry explaining the CMP procedure to those who have not yet made application for third-quarter requirements. This letter points out that the provisions of P-98-b should be followed until the revised order is issued.



Salt water injection operations in East Texas typified by this field picture of one well in the system, will be expanded under recent WPB assignment of a higher priority rating, AA-3, for additional equipment

THIS WEEK

EQUIPMENT—Industry warned to schedule material requirements, before March 31, when CMP becomes effective. . . . Current scheduling, PAW says, doesn't equal allotments already earmarked for petroleum. . . . Deliveries during second quarter to be based on CMP. . . . Failure to heed warning may pinch operators requiring steel for development and producing activities. . . . ¶Higher rating, an AA-3, assigned for $450,000 worth of facilities to extend salt-water injection operations in East Texas. . . . ¶New regulations, supplanting P-98 orders, expected about April 1, dovetailing priority ratings with CMP. . . .

REFINING—Spasmodic operations predicted this year for District 3 plants which have no war contracts. . . . No relief from transportation jam envisaged until second quarter of 1944. . . . MEANWHILE, nonessential products must yield transportation space to war materials, egressing from District 3. . . . Southwestern refiners disgruntled because restrictions do not apply equally on neighbors in District 2. . . . ¶Seventy-seven catalytic cracking plants in operation, under construction or authorized. . . . ¶Eastern refineries hampered in maximum war production because of crude shortages. . . .

TRANSPORTATION—Rail deliveries to East Coast recede slightly, to 797,102 bbl. daily, because tank cars are being shuffled again, to effect maximum traffic between Norris City terminal of WEP and East Coast. . . . ¶WPB decision on eastern extension of 20-in. products line awaits completion of detailed project, by PAW. . . . ¶WEP crude runs gradually rising, between Longview, Tex., and Norris City, Ill.; traffic now exceeds loading and shipping facilities. . . . BUT adjustments now under way to correct maladjustments. . . .

MARKETS—All products are steady at ceiling levels, except softness in regular motor fuel in California. . . . Crude purchasers, mostly in District 2, continue search of the producing areas for additional supplies, without appreciable success. . . . Jam of products, including fuel oil, on Pacific Coast, considered only a temporary result of inability to maintain regular schedule on military deliveries. . . . Agitation intensified for broader use of West Texas sulfur oils. . . . OPA surveying refining cost, study may tie in with crude-advance campaign. . . .

PRODUCTION—Conservation law "with constructive powers" again proposed in Illinois, with enunciated support of governor and Petroleum Administrator Ickes. . . . Figures refute Sumner T. Pike's declaration—he is petroleum pricing chief for OPA—that first quarter discoveries already exceed total for 1942. . . .

INTERNATIONAL—Newly ratified Venezuelan oil law contains broad probability for higher production, increased shipments to consuming countries, greater nationalization of refining capacity. . . . Companies assured of 40-year producing period, inviting greater development, slower rate of production. . . . Last shipment of United States petroleum to Spain made February 19, 1942. . . . Future deliveries from South America subject to agreement of British and American governments, Sumner Welles declares. . . .

Part of the ODT petroleum-transportation staff. E. G. Waring, assistant to the associate director; George J. Reynolds, chief of the unit on other liquids; A. V. Bourque, associate director in charge of the section on tank-car service and G. E. Everett, chief of the petroleum section

Petroleum Section of ODT Is Expanded

WASHINGTON, D. C.—Personnel changes required in the Office of Defense Transportation's Division of Petroleum and other liquid transport by increasingly critical wartime problems were announced last week.

The enlarged staff is required to handle the additional work involved in ODT Order 7 as revised last December which set up administrative machinery for assigning and routing tank cars carrying all types of liquid products. The ODT works closely with the Transportation Division of the Petroleum Administration for War and the Chemicals Division of the War Production Board, as well as with other industries using tank cars. In the case of oil, PAW determines quantities of petroleum or products to be shipped by rail from designated points of origin to certain destinations, and ODT works with the railroads in handling the actual transportation problems such as routing, exchange of cars and train schedules. ODT and PAW have cooperated closely in this work for several months, and there is a clear division of authority and jurisdiction.

Fayette B. Dow will continue as director of the division in which are centered the activities connected with transportation facilities for the movement of petroleum and other liquids. He will supervise and coordinate the services performed for the transportation of these particular products by his division and the Divisions of Railway Transport, Traffic Movement, Inland waterways, Great Lakes Carriers, and Motor Transport.

In connection with personnel changes, ODT Director Eastman established a small field force to decentralize the activities of the section of tank-car service and announced the following appointments:

Porter L. Howard of Philadelphia, associate director of the division. Mr. Howard came to the ODT from the Sun Oil Co., of which he was general traffic manager.

Assistant to Dow

Mr. Howard has been assigned responsibilities similar to those of the director of the division. He will assist Mr. Dow in the coordination of ODT services in the rail, water, pipeline and truck transportation of petroleum.

Robert W. Shields, associate director, in charge of pipe lines. Mr. Shields has been chief of the ODT Pipe-Line Section since April 1942. An Interstate Commerce Commission engineer for 28 years beginning in 1914, he was in charge of pipe-line valuation work for the ICC after 1934.

He will represent the ODT and the division in all activities connected with the construction, enlargement, interconnection, and operation of pipe lines, handling in particular the engineering phases of these programs.

A. V. Bourque, associate director in charge of the section of tank-car service, of which he was until recently the chief. Before coming to the ODT in May 1942, Mr. Bourque served as tank-car consultant, first for Ralph Budd, transportation commissioner of the Advisory Commission to the Council for National Defense and later for Mr. Eastman.

Mr. Bourque will supervise the activities of the petroleum unit and the other liquids unit, which comprise the section of tank-car service. He will be responsible for keeping industry, as well as the Army, Navy, and other government agencies, supplied with tank cars sufficient for all essential needs.

Harry R. Lewis of Warren, Pa., assistant to the director. Mr. Lewis, whose experience in the oil industry covers a period of 23 years, is president of the Harry R. Lewis Co., a petroleum specialties firm. He was president of Hyvis Oils, Inc., Warren, for 6 years, and president and general manager of the Conewango Refinery Co. of that city for 15 years. Mr. Lewis will handle special assignments for the division.

War Department Background

E. G. Waring, of Washington, D. C., assistant to Mr. Bourque. Mr. Waring, who has had many years of railroad and industrial traffic experience, was released to the ODT by the War Department, after he had been with that department as industrial traffic specialist for more than a year. He served the Missouri Pacific Railroad for 28 years.

G. E. Everett, chief of the Petroleum Unit of the section of Tank-Car Service. Mr. Everett for several years served with the American Petroleum Institute, the Western Petroleum Refiners Association, Transcontinental & Western Air, a number of railroads, and the ODT tank-car service committee. He was assistant chief of the section from June 1942 until his recent appointment. Mr. Everett will supervise the ODT program to improve the utilization of tank cars in the petroleum traffic.

George J. Reynolds of New York

City, chief of the unit of other liquids.

Ayden A. Dibble, chief of the Pipe-Line Section. Mr. Dibble was chief engineer of the section from June 1942 until his recent appointment. He has served as an engineer in the valuation of pipe lines for the ICC most of the time since 1911. He will be in charge of ODT engineers handling problems connected with the construction, enlargement, interconnection and operation of pipe lines.

H. P. Ross, of Washington, D. C., first assistant to Mr. Everett. He has for the past 3 years been in charge of tank-car movement for the Quartermaster Corps of the U. S. Army He directed the New York traffic department of Cities Service Oil Co. for 3 years.

David H. Rotroff, of Chicago, also assistant to Mr. Everett. His career has been devoted entirely to railroad and industrial traffic, particularly with the Nashville, Chattanooga & St. Louis Railway.

Three regional managers for the section of Tank-Car Service, who will issue permits for short-haul movements within their territories, study efficiency with which tank cars are being used, and remove surplus cars wherever they exist and place them in other services. They also will expedite the loading, movement, and unloading of tank cars.

The regional managers are:

R. A. Green, eastern district, with offices in New York City. Mr. Green was connected with the Chicago, Burlington & Quincy Railroad Co. and for 18 years with the Standard Oil Co. of New Jersey. His district will include all of the New England and New York area.

Eugene Jackson, western district, with offices in San Francisco, Calif. His district extends over all states west of the Rocky Mountains.

John W. Painter, Gulf Coast district, Houston, Tex. He was for many years in charge of tank-car operations for Texas Co., and later for the Sims Oil Co. and the Deep Water Refining Co. He also served various railroads. Mr. Painter's territory will include the Southwest area and part of the Southeast area.

Tanker Replacements Will More Than Equal Submarine Sinkings

NEW YORK.—Tanker replacements made in 1942 and expected in 1943 will more than offset the tonnage lost because of enemy submarine warfare, it was disclosed here this week by W. S. S. Rodgers, president of the Texas Co., in his annual report to stockholders. This declaration, of course, applied only to Texas Co., but it may be reasonably construed as representative of the domestic industry.

Directors of the company created a reserve of $12,000,000 to cover contingencies arising out of the war. Mr. Rodgers cautioned, however, that the company is unable to determine the full effect of the war upon its worldwide operations and the extent to which, during the war and in the postwar period the methods of doing business may be subjected to further change.

Economy of the industry has been upset, Mr. Rodgers emphasized, because of the increase in the quantity of the lower-priced products and the failure, to date, of the OPA fully to increase the price of either gasoline or the lower-priced products to offset the loss in revenue due to manufacturing changes.

Upon completion of several additional sulfuric acid alkylation plants, Texas Co., the president said, will be one of the nation's largest manufacturers of 100-octane aviation gasoline. Construction is practically completed on a toluene plant built under government contract and it will be activated in the near future.

When completed, the latter part of this year, Neches Butane Products Co.'s butadiene plant on the Gulf Coast, in which Texas Co. has a 30 per cent nonprofit interest, probably will be the largest of its kind in the world, stockholders were advised.

Runs to stills at the company's refineries were approximately 13 per cent lower in 1942 than in the previous year. However, the company practically doubled its production of aircraft-engine oils by completion of additional manufacturing facilities.

Exploratory Drilling Increased

A material increase in the number of exploratory wells drilled or the development of an entirely new technique for locating deposits of oil other than the structural type of reservoir were advanced by Mr. Rodgers as apparent necessities.

Failure to maintain the crude reserves in the United States, he said, will make necessary in future years the importation of crude oil of foreign origin in order to provide for the country's military, industrial and civilian requirements.

The company increased its crude-oil reserves during the year to the highest level in its history as of December 31.

Exploratory drilling was increased 35 per cent in 1942 but the total number of wells drilled, including development operations, decreased approximately 36 per cent.

Consolidated net profit for 1942, after deduction of all charges, including interest, depreciation, amortization, depletion and taxes (including provision for federal income and excess-profits taxes) amounted to $35,060,001.06, equivalent to $3.22 per share. This compares with a net profit of $51,874,681.29, or $4.77 per share, for 1941.

Net working capital (excluding European subsidiaries) at the close of the year was $174,619,189.58 compared to $148,797,057.50 at December 31, 1941. Total current assets on December 31, 1942, amounted to $236,649,900.37, and total liabilities were $62,030,710.79. Dividend payments in 1942 aggregated $2 per share, 50 cents less per share than was paid in 1941.

Spasmodic Refinery Runs In District 3 Predicted

FORT WORTH, Tex.—District 3 refiners who are not on a schedule of essential war materials may expect spasmodic operations in 1943, a letter from Ralph K. Davies, deputy administrator of PAW, informed Charles F. Roeser, chairman of the general industry committee for the district. All refiners in Texas, New Mexico, Arkansas, Alabama, Louisiana and Mississippi have been forwarded copies of the letter. In his letter, Mr. Davies asserted that production of critical war products would cause a larger proportion of total transportation available to be allotted to moving of war-essential materials away from District 3 plants.

Furthermore, he stated that even assuming completion of all the new transportation projects now planned from the Texas area, forecasts indicated that there is little hope of substantial relief from the transportation bottleneck until the second quarter of 1944.

The only exceptions allowed to the program will be a limited number of inland nonwar refineries engaged in supplying local demands which otherwise could not be supplied without inefficient use of transportation, Mr. Davies said.

Nine Tankers Delivered Into Service in February

A total of nine tankers was delivered into service during February according to the Maritime Commission. Two of these were built by Bethlehem-Sparrows Point Shipyard, Inc., Sparrows Point, Md., one by Kaiser Co., Portland, Ore., and six by Sun Shipbuilding & Dry Dock Co., Chester, Pa.

State Capitals

OKLAHOMA

A BILL providing that kerosene of 46 gravity or under does not come under the state statutory definition of motor fuel has been approved and recommended for passage by the oil and gas committee of the state legislature. Under the present law covering taxes on motor fuel, an oil product of more than 44 gravity is subject to the motor-fuel tax.

It is claimed that increasing the permitted gravity of kerosene to 46 will not affect the safety factor of kerosene as the flash point would remain the same and that the higher gravity of kerosene would not make it more desirable as a motor fuel because of low volatility.

TEXAS

TEXAS RAILROAD commissioners have prepared for the monthly statewide hearing proof that high-octane gasoline can be refined from the sour crudes of West Texas and also that some Gulf Coast fields are unable to produce their allowable. The commissioners and many producers have been petitioning PAW to order major purchasers to take a ratable share from the fields of West Texas but, instead, directives have come through calling for more Gulf Coast crude.

In his telegram to Mr. Ickes, Beauford Jester asked that "consideration be given the ample, available sour crudes of West Texas fields and the analyses made by the Bureau of Mines which show that by desulfurizing these crudes, high-octane gasoline can be obtained. We suggest that your refinery, transportation and storage divisions began planning for use of this oil in the immediate future."

Mr. Jester said recently that the Bureau of Mines had reported favorably on samples of sour crude from the Henderson, Goldsmith, Yates, Panhandle, McCamey, Big Lake, Slaughter and Wasson fields and that tests are being conducted on other sour crudes from the district. Producers have long contended that the crude could be processed to make aviation gasoline and that this would not be expensive. Refiners have countered these claims with the statement that the wear of equipment has made refining of West Texas crude impracticable. The producers point out that several companies, including Standard Oil Co. of Indiana, Shell Oil Co., Inc., Atlantic Refining Co., Standard Oil Co. (New Jersey) and its subsidiary Humble Oil & Refining Co., Gulf Oil Corp., Texas Co., Sinclair Prairie Oil Co., Tide Water Associated Oil Co. and Standard Oil Co. of Texas. They ask that chemists of these companies be asked to show the steps necessary to increase the processing of sour crude and that, if extra equipment is needed, steps be taken to obtain it as more oil will soon be needed from West Texas.

GERALD C. MANN, attorney general, ruled last week that holders of State University leases have the alternative of fully developing the leases or subjecting them to forfeiture by the land commissioner. The ruling was given at the request of C. D. Simmons, University comptroller, to determine whether the Board of Regents or the Board for Lease of University Lands could enter into supplemental agreements with lessees who had acquired their holdings under the Act of 1917.

The ruling affects over 110,000 acres of University-owned lands.

A BILL CREATING a commission to administer oil and gas regulatory matters now handled by the Texas Railroad Commission was introduced in the senate last week by Penrose Metcalf, of San Angelo. One petroleum engineer, one attorney, and one business man would serve on the commission, all appointed by the governor for terms of 6 years, with administrative power vested in an executive director. Creation of the commission would entail no further expense as taxes are already levied to pay operating costs of the Railroad Commission's oil and gas divisions, Senator Metcalfe said.

EXTENSION of nonproducing oil leases on University of Texas land where federal or state restrictions in effect 120 days before expiration of the primary term prohibit the owner from drilling, completing or using materials in drilling or completing wells is provided in a bill introduced in the legislature last week by Rep. Houghton Brownlee of Austin.

A MEASURE to prevent discrimination in crude-oil purchasing was pending before the house of representatives. The measure is intended to prevent pipe-line proration, according to its author, Harley Sadler, of Sweetwater. "Purchasers make the nominations," Mr. Sadler said, "and yet in many instances only 40 to 50 per cent of the oil asked for is being taken by the pipe-line companies."

BY A FAVORABLE vote of 8 to 2, the controversial bill permitting voluntary pooling of discovered or undiscovered oil fields for development and operational purposes was sent by the senate oil, gas and conservation committee to the senate floor. The vote followed testimony by Clint C. Small, attorney for the Richardson Petroleum Co.; Paul C. McDermott, of Sinclair, and H. P. Nichols, executive vice president of the East Texas Oil and Gas Association. In his testimony Mr. Small emphasized that the bill permitted voluntary pooling with no compulsory obligations on tract owners.

ILLINOIS

EXPECTATION IS that the administration soon will introduce in the legislature amendment to the Illinois Conservation Act passed in 1941 and now in effect.

This act once was labeled as "a joke" by Harold L. Ickes, petroleum administrator, who charged that it failed to give the state any authority to control oil production in instances where it might be wasteful to the state's reserves.

Governor Green said he did not know what amendment would be sought, but indicated that "in general" the proposed changes would follow the lines of a conservation bill which was supported by the administration but defeated in the 1941 session.

This bill, it was stated, would have set up a state commission with power to make rules governing oil and gas production in the state and would limit and regulate drilling.

Mr. Ickes' plea recalled that earlier this week Governor Green said the administration was planning to introduce in the legislature amendments to the 1941 Conservation Act. This was before receipt of Mr. Ickes' telegram to Governor Green in which he urged adoption of state legislation which would enforce sound production practices.

KANSAS

PRODUCTION regulations for April will be determined on the basis of market demand and production testimony presented before the Corporation Commission at Wichita, March 23. In setting the date for the regular monthly hearing, the commission issued the usual instructions to purchasers to file nominations covering crude requirements next month.

the OIL AND GAS JOURNAL

PRODUCTION - TRANSPORTATION
REFINING - NATURAL GASOLINE

Founded in 1910 by
PATRICK C. BOYLE

No Place for Rivalries

MANY are beginning to wonder if too much attention is now being paid to the individual positions of the five districts in the activities of PAW and PIWC. These district divisions were established in July 1941 to facilitate the administration of the industry's defense and war efforts.

There are reports of recent meetings in which it is apparent that representatives of each division made every effort to further the interests of their district with too little attention given to the effects on the industry as a unit. One hears of "imports" and "exports" in regard to the incoming and outgoing movements of petroleum among districts with much the same implications as when foreign operations are discussed in normal times.

The inevitable result is that there are now charges that one district is benefiting from the changes made necessary by the war program at the expense of another with greater inequities in prospect after the war as a further result.

The five districts briefly described are: (1) East and part of the Southeast; (2) Middle West, Oklahoma, Tennessee, and Kentucky; (3) Southwest, Mississippi and Alabama; (4) Rocky Mountains; (5) West Coast and Arizona.

Any appraisal will quickly show that those who established these districts could not have had in mind a division which would make each district a complete operating unit within itself. On the West Coast when exports as well as domestic operations are considered, and in the Rocky Mountain district there is some balance between petroleum supply and demand although there are shipments to and from other districts.

For the large section east of the Rocky Mountain states where most of this country's oil is produced, refined and consumed, none of the first three districts approach an operating balance.

District 1 has less than 2 per cent of the country's crude-oil production and yet it normally refines 16 per cent and consumes 36 per cent of the gasoline. At the other extreme is District 3 with 51 per cent of the crude oil, 36 per cent of the refining capacity and only 10 per cent of the gasoline consumption. Between these two areas is District 2 with 24 per cent of the crude oil, 27 per cent of the refining capacity and 39 per cent of the gasoline demand.

These data clearly show how interdependent these three districts are in every phase of wartime operations. District 1 is more than 98 per cent dependent on outside crude-oil and product supplies. District 2 does not have sufficient crude oil for its refineries and the output of these plants must be supplemented with refined products coming from Districts 3 and 4. District 3 must look to other districts as outlets for 90 per cent of its output.

With the pressure of war coming from all directions this isn't the proper background nor the time for discussions by operators of how they can best "protect their district." The only excuse for the creation of the five districts was to afford operators convenient centers at which they could do their part in solving war problems which recognize no boundary lines within this country.

It is true that all of the major decisions affecting petroleum's war operations have acknowledged this basic situation. No district rivalries should now be permitted to circumscribe what has been done or confuse future war and postwar plans.

Many Joint-Facility Uses Already Effected in District 2

CHICAGO, Ill. — Specific recommendations were made here this week by the PAW District 2 marketing committee on the joint use of facilities to conserve transportation equipment, rubber, manpower and various distribution supplies. Recommendations followed an exhaustive study of the savings possible by the joint use of all types of facilities made by a subcommittee, headed by H. T. Ashton, Socony-Vacuum Oil Co., Inc. The full report, including numerous statistical exhibits, maps and tabulated data, contains several hundred pages.

The subcommittee found that petroleum marketers in District 2 generally have already effected many of the possible savings in mileage and manpower and have arranged for the joint use of marketing facilities to the maximum efficiency without waiting for any general instruction by governmental fiat.

Other members of the District 2 subcommittee on the joint use of marketing facilities are N. C. Bein, W. H. Barger Co.; Walter Hochuli, Texas Co.; Paul Kempf, Staebler-Kaempf Oil Co.; Joseph L. Nolan, Farmers Union Central Exchange, Inc.; A. A. Stambaugh, Standard Oil Co. of Ohio; William H. Tell, Standard Oil Co. (Indiana); E. J. Webster, Phillips Petroleum Co., and Phil T. Williams, Gaseteria.

The recommendations were broken down to cover specific types of operations, the committee concluding that no one general program could be satisfactorily adapted to all conditions. The recommendations follow:

Urban Areas

1. Immediately increase dump sizes by every possible means.

2. Take such action as may be necessary to accomplish internal operating efficiencies.

3. Make arrangements for intercompany use of bulk plants wherever savings can be effected.

Rural Areas

1. Immediately increase dump sizes by every possible means.

2. Take such action as may be necessary to accomplish internal operating efficiencies.

3. Make arrangements for intercompany use of bulk plants and schedule and publish farm routes of delivery, giving due consideration to emergency and seasonal conditions.

4. Publicly request farmers to assist the war effort by taking larger deliveries, giving at least 48 hours' advance notice of needs and requesting special deliveries only in case of extreme emergencies.

Bulk Plants

The committee recommended that no arbitrary action be taken to reduce the number of bulk plants in District 2. The pressure of the time, the report pointed out, and the economic forces now at work will reduce the number of plants to the minimum necessary for essential distribution.

Retail Outlets

Economic factors, the committee held, will reduce the number of service stations to the minimum necessary for essential transportation. Studies made by the field men, the committee said, indicate that many retail outlets are closing as a result of economic conditions. The increased demand for manpower in the armed forces and defense industries is straining the continued operation of the remaining stations and making it increasingly difficult to adequately service the needs of military and civilian cars and trucks. In September 1942, the report said, approximately 50 per cent of all retail outlets in District 2 were operating in connection with another business. Little or no available manpower could be released by discontinuing the sale of products at such points.

The committee suggested a special survey of fuel-oil distribution before the next heating season.

Pike Advises Industry To Effect Economies

WASHINGTON, D. C.—Sumner T. Pike, director OPA Fuel Price Division, has announced that "general retrenchment" and "tightening up" must be done by the oil companies themselves before serious consideration can be given to price increases and the widening of dealer and jobber margins. He pointed out that Middle West refiners were still running too much gasoline and that if he decided to cut the price of motor fuel, no attention will be paid to inventories. Mr. Pike also stated that Middle West refiners were in a much more favorable position than East and Gulf Coast refiners. The East is faced with high-priced commodities and lack of supply while on the Gulf there are transportation difficulties which prevent products from reaching markets. The Middle West has none of these troubles, he said.

Mr. Pike said that no petition had been received from Mr. Ickes asking for a price increase and that he was studying the recent PIWC request for a 1-cent increase in retail gasoline prices with no more than ½ cent allocated to jobbers. Requests of groups of jobbers and retailers for increases as high as 3 or 4 cents are out, so far as he is concerned, he said.

He also stated that OPA could not handle individual distress situations and that no special price consideration was planned for the Chicago area. He warned that as OPA had never received enough basic information on the price situation it might be impossible to grant any increase and that even if one were granted it might be vetoed by James F. Byrnes.

He minimized the argument that handling coupons increased dealer costs with the statement that such increase did not amount to more than 0.1 cent a gallon. On the other hand, he pointed out that in many stations in the East only 6 minutes in every hour was being devoted to actual distribution of gasoline as sales have declined by as much as 60 to 75 per cent. This he considered a waste of manpower and pointed out that although there was no law permitting OPA to close up stations, it was up to the industry to do something about it. It is understood that the War Manpower Commission would like about 100,000 of these service-station operators in the armed forces, he said.

Salt Water Company Assigned Higher Priority

TYLER, Tex.—The East Texas Salt Water Disposal Co. has been assigned an AA3 preference rating for the acquisition of necessary materials to carry on their program. Materials valued at $450,000 will be needed, which will be made procurable by the higher preference rating granted. This indicates that PAW and WPB are satisfied with the progress that has been made in the matter of returning salt water to the producing reservoir, and with the ultimate benefits that are to be obtained.

Last month one additional salt-water-disposal system was completed and extensions made to the facilities already installed. A total of 734 wells producing water were served and an average of 45,296 bbl. per day of salt water injected. It is planned to increase the disposal facilities under the present program already in effect to a total capacity of approximately 140,000 bbl. per day.

OPA Studying Refinery Costs

by Henry D. Ralph

WASHINGTON, D. C.—A study of refinery costs is being made under direction of the Office of Price Administration but few details of the purpose or the progress have been disclosed here to the petroleum industry. The U. S. Tariff Commission, originally reported to be making the refinery-cost study, is not directly responsible for this survey but has loaned a number of its cost experts to OPA to assist in the work of compiling the data.

This OPA study does not necessarily mean that an upward revision of product prices is imminent but only that the pricing agency is seeking to keep informed on refinery costs. However oil men here and from other parts of the country who have been pressing for an advance in crude prices see a possible relation between their representations and the refinery-cost study.

Recommendations from the PIWC for an advance in crude-oil prices submitted several weeks ago to the PAW were modified with the assertion that a commensurate increase in the price ceilings on products should be made at the same time.

Sampling Changes in Costs

Meanwhile, the Tariff Commission is completing its detailed analysis of its sampling of changes in cost factors of producing crude during the first half of 1942, but probably will not publish these figures since they are not expected to result in any changes from the summary of them included in the commission's report on crude-production costs.

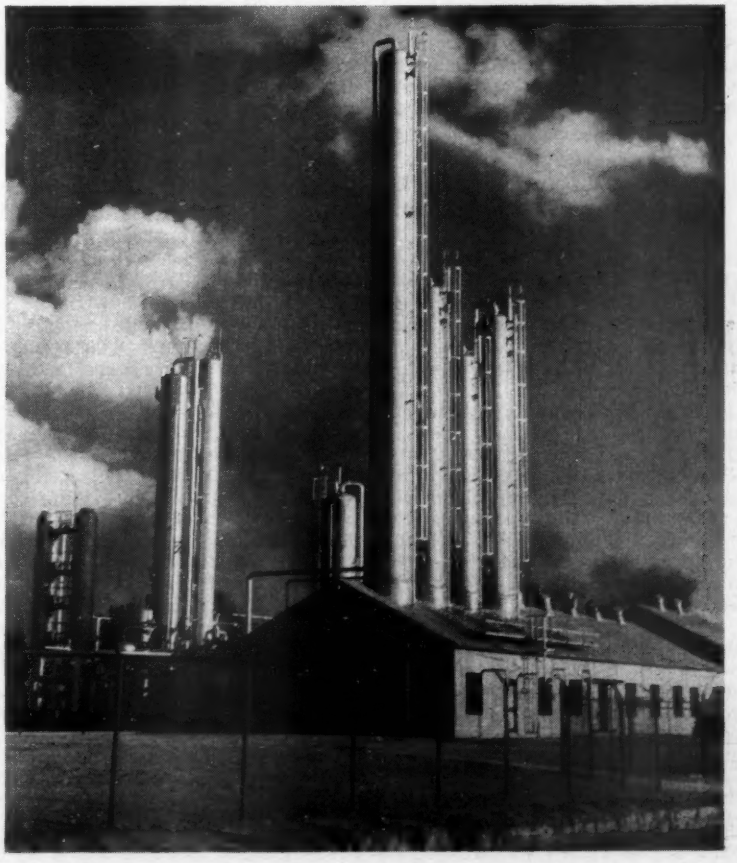
Criticisms of the commission's report on the cost of producing oil, a survey made at the request of the Office of Price Administration, continue to arise within the petroleum industry. With the passage of time since the crude-cost report was issued last month, the criticisms have gradually swung away from the Tariff Commission and are now practically all concentrated on the OPA. Representatives within the industry are adamant toward OPA for the use made of the Tariff Commission report and now generally appreciate that the commission was merely performing a factual service at the instigation of another agency.

Statisticians who have made a careful study of the report point out that most of these criticisms stem from a misunderstanding of the nature of the report and the way in which it was prepared. It is explained that the report does give an accurate picture of the composite costs of producing all crude petroleum in the United States in any given period, but it fails to satisfy oil men in that it does not purport to show what it would cost to go out today and produce a barrel of oil starting from scratch.

The Tariff Commission has been computing figures on the cost of producing crude oil in the United States for many years, and has published its findings for the years 1927 to 1934, inclusive, which may be compared with its recent report which covered 1939, 1940, and the first 9 months of 1941. This comparison is given in the accompanying table.

It will be noted that the item for intangible development costs dropped precipitously in 1931, and it is explained that this is due to a change in accounting methods used by the commission. Prior to 1931 these items were charged off as expense in the year the well was drilled, but since 1931 they have been capitalized and charged off on a per-barrel basis according to the estimated reserves under each well, and a total dollar figure used for intangible drilling costs was divided by the number of barrels of oil produced. The result is that where oil is currently produced from a well drilled prior to 1931 the commission shows no capital chargeoff. When the basis was changed in 1931, only a small portion of the oil produced that year had this

Figuring more prominently in extraction of components for petroleum war products are modern natural-gasoline plants such as pictured here, including facilities for separation of butanes, propanes and pentanes for superfuels and synthetic rubber



Crude-Oil Production Costs, U. S. Total as Compiled by U. S. Tariff Commission

Cost items—	1927	1928	1929	1930	1931	1932	1933	1934	1939	1940	1941 (9 mos.)
Depletion	$0.129	$0.118	$0.108	$0.094	$0.084	$0.081	$0.073	$0.074	$0.064	$0.059	$0.055
Intangibles	.269	.235	.277	.212	.037	.043	.054	.060	.119	.124	.124
Depreciation	.187	.166	.157	.177	.160	.152	.134	.126	.110	.104	.105
Subtotal	$0.585	$0.519	$0.542	$0.483	$0.281	$0.276	$0.261	$0.260	$0.293	$0.287	$0.284
Operating cost	.305	.294	.277	.284	.220	.213	.187	.228	.238	.228	.237
General*	.270	.257	.241	.283	.247	.264	.217	.241	.301	.283	.276
Subtotal	$0.275	$0.551	$0.518	$0.577	$0.567	$0.477	$0.404	$0.469	$0.539	$0.511	$0.513
Gross total	$1.16	$1.07	$1.06	$1.06	$0.848	$0.753	$0.665	$0.729	$0.832	$0.798	$0.797

*Includes administration costs.

capitalization item charged against it, and yet this small portion was divided into the total amount of oil produced that year in computing the average cost per barrel. After a period of years, when no more oil is being produced from any wells drilled prior to 1931, this method will give a true figure, but at the present time it is misleading.

Development Costs Not Specific

In addition to this change in accounting methods, all three items on depletion, depreciation, and intangible development costs suffer from the fact that they are moving averages rather than specific figures for a given year, and do not give any indication of the cost of producing oil from wells drilled in that year. For any one year, as the Tariff Commission computes it, these capitalized costs include not only the costs of new production but also the costs of wells which have been producing for many years. If a considerable amount of oil comes from old wells with a relatively low capital investment per barrel of production, the average cost is brought down proportionately. The figures are cumulative moving averages for the country as a whole and do not attempt to reflect costs of new wells under current conditions.

The Tariff Commission's studies originally were made to compare the costs of domestic oil production with foreign costs in order to form the basis for policy decisions by the president in fixing duty rates under the now obsolete flexible tariff law. Therefore the figures are probably quite accurate for long range and over-all cost comparisons, but they should not be taken as indicating what it would cost a producer to develop a new oil pool on any given date.

The items on current operating costs given by the Tariff Commission are not subject to this criticism and probably do give an accurate picture of out-of-pocket costs, averaged for the country as a whole, from year to year.

Summary of Current Tire Rules

WASHINGTON, D. C. — Substantial modifications have been made in the restrictions on reclaimed rubber, resulting in liberalized rules permitting all classes of vehicles to obtain minimum essential tires.

Here is a brief summary of current rules applicable to various types of vehicles in need of tire replacements:

Passenger cars. — There is no restriction on the recapping of passenger-car tires with "passenger-type camelback." "Camelback" is any rubber compound designed for application to a worn tire to make a new tread. "Passenger type" camelback is made of reclaimed rubber only, using no crude. Cars with mileage allowances up to 560 miles a month (A and B cards) are entitled to Grade 3 tires, which are used or recapped tires. (This is in addition to the permission to recap the car's own tires.) Cars with mileage allowance of from 560 to 1,000 miles a month (C card), are entitled to Grade 2 tires such as a new reclaimed-rubber tire or a prewar tire priced at 85 per cent or less of the price of new-car equipment grade. Cars with mileage allowances of more than 1,000 miles a month (C card with longer mileage) can have choice of any kind of passenger tire.

Trucks and trailers. — Trucks and trailers included in the List A eligibility classification in OPA's regulations (those vehicles providing services deemed most essential by OPA) are eligible for new crude-rubber tires if their present casings can't be recapped. Trucks and trailers performing important services not on List A may apply for certificates entitling them to recapping with "truck-type camelback," which includes a certain amount of crude rubber. Truck tires cannot be made or recapped with reclaimed rubber only.

Taxis.—Cabs operating under ODT rules are eligible for truck-type recapping or for new tires if their casings are not recappable.

Buses.—Public buses operating regular routes and services are eligible for recapped or new tires.

Private buses performing certain necessary transportation services, including carrying persons to certain essential establishments or schools, also are eligible for recapping or for new tires.

Petromex Chief Seeking $10,000,000 Worth of Supplies

Efrain Buenrostro, chief of Petroleos Mexicanos, the Mexican Government's petroleum agency, was to arrive this week in Washington, D. C., and present application for priorities on new petroleum facilities valued at $10,000,000, according to reports from Mexico City.

Before leaving Mexico City, Mr. Buenrostro said he would ask for the preference ratings necessary to secure materials for at least one high-octane plant. The facilities sought would enable Mexican refineries to recover gas now consumed as fuel in manufacturing and field operations.

The improvement program for which Mexican officials are now seeking necessary construction materials in the United States includes pipe for a better line from the Poza Rica field to the seaboard and equipment for the production of wax.

Nearly 2 Million Barrels Of U. S. Crude Sent to Spain

WASHINGTON, D. C.—Shipments of petroleum products from the United States to Spain during the last 2 years, the House was informed last week, totaled 245,118 metric tons (roughly 1,942,000 bbl.) and were made with the understanding the products would not leave Spanish territory.

This information was in a letter from Acting Secretary of State Sumner Welles to Chairman Sol Bloom, New York, of the foreign affairs committee, in response to a resolution seeking to determine how foreign petroleum shipments affected the domestic supply, especially on the eastern seaboard.

Exports of petroleum products from the United States to Spain were 227,347 metric tons (about 1,800,000 bbl.) in 1941 and 17,771 metric tons (about 142,000 bbl.) in 1942, Mr. Welles advised, and "these are the only shipments made from the United States in the last 2 years," the last bulk shipment having been on February 19, 1942.

"However," Mr. Welles continued, "by arrangement between the governments of the United States and Great Britain," Spain has been permitted to carry limited quantities of South American oil in Spanish vessels through the blockade.

PAW To Create Office Of Labor Counsellor

WASHINGTON, D. C. — The Petroleum Administration for War is preparing to create the office of labor counsellor to advise on all matters concerning labor relations and manpower supply in the oil and gas industries and to assist in formulating policies on these subjects.

The counsellor will serve as liaison with the War Manpower Commission, War Labor Board, National Labor Relations Board, Department of Labor, and the labor divisions of other government agencies on all matters concerning the oil and gas industries. He will also serve as the channel of communication with the Manpower Committee of the Petroleum Industry War Council and with other committees of the industry.

It is understood that the new post probably will be given to Dr. Frederich H. Harbison, who is on leave from the Economics Department of the University of Chicago. Dr. Harbison has been serving as labor adviser for several months with various government agencies, including the War Department and the old Office of Production Management.

Profit and Loss Report Form Q20 Abolished by OPA

WASHINGTON, D. C.—Oil companies which have been filing monthly comparative statements of profit and loss on OPA Form Q20 may now discontinue this practice.

Because recent adjustments in price ceilings on crude petroleum and refined products have obviated the need for future monthly statements of profit and loss, no further requests will be made for the filing of this form, OPA said last week.

OPA said it was expected the elimination of monthly reports will result in even greater cooperation from oil companies in filing annual and quarterly data on OPA Forms A and B.

Gulf Pays $1,200,000 for Lease in K.M.A. Field

WICHITA FALLS, Tex.—Gulf Oil Corp. is reported to have purchased from Consolidated Oil Co. of Wichita Falls, a three-quarter interest in a 229.5-acre lease in the K.M.A. field. The Joe Howell estate of Electra owns the remaining quarter. It is reported that Gulf paid $1,200,000 cash for the interest which involves 22 producers, including 15 in the regular K.M.A. Strawn pay. The remaining seven wells produce from the Ellenburger. Gulf is reported to be negotiating for other North Texas properties.

Federal Order Digest

Petroleum Administrative

Gasoline—PAO 1, Amendment 2, amended: Lifts limitation on the amount of gasoline withdrawn from primary storage each month for agricultural use in the 17 eastern states, issued March 12.

Pipe Line—Formal application submitted to WPB, requesting steel for eastern extension of 20-in. products line, filed March 8.

OPA Rationing Orders

Gasoline—RO 5c, Amendment 29: Qualifies radio broadcasting engineers and technicians for C cars for transporting heavy equipment to and from temporary broadcasting locations, effective March 17.

Gasoline—RO 5c, Amendment 30: Provides special rations of gasoline to permit short trips to deliver newly acquired automobiles to places where they are to be garaged or stored, effective March 19.

Fuel Oil—RO 11, Amendments 45 and 46: Authorizes householders who face serious hardship under fuel-oil rationing due to abnormal conditions to apply to local boards for supplemental allotments; empowers local boards to recommend disposition to appropriate district OPA office, effective March 13.

Fuel Oil—RO 11, Amendment 47: Bans use of 100-gal. auxiliary rations, if users can obtain the extra heat from coal or wood stoves, effective March 15.

Jute and Istle Rope—MPR 340: Specifies prices for substitute ropes made from jute and istle to promote manufacture of substantial quantities, effective March 10.

Profit and Loss Reports — OPA Form Q20: Voids requirement that oil companies file monthly comparative statements of profit and loss because recent adjustments in price ceilings obviate the future need for such data, issued March 13.

WPB Priority Orders

Petroleum Coke—M-212, amended: Permits packing of certain commodities in petroleum coke during backing process, a manufacturing technique not previously specifically permitted, effective March 15.

Priorities System—PR 3, amended: Simplifies application of preference ratings to telephone and telegraphic orders, permitting immediate extension of ratings to supplier, effective March 9.

Oil Measures—LO-30a, Interpretation 1: Allows production of measures with rigid spouts which are so attached to the cans that spouts can be raised, lowered or adjusted, effective March 11.

Antifreeze Solutions—LO-258: Adds eight antifreeze solutions to the list of "deleterious antifreeze solutions," the production and sale of which are prohibited, effective March 11.

Synthetic Rubber—Voids preference ratings previously extended to Magnolia Petroleum Co., at Beaumont, Tex.; Standard Oil Co. (Indiana) at Wood River, Ill., and Pan American Refining Corp. at Texas City, Tex., for "quick" butadiene conversion projects, effective March 12.

Alcohol Plants—Designates Iowa Farm Processing Cooperative, Consumers Cooperative Association, Joseph E. Seagram & Sons., Inc., Schenley Distillers Corp., and Hiram Walker & Sons, Ltd., leases on new grain-alcohol plants, issued March 9.

CMP Regulations

Incorporated Products—CMPR 8: Establishes procedure under which controlled-materials producers will obtain materials required for incorporation in their products, issued March 13.

Applications—Form CMP-4a: Simplifies applications for allotments of aluminum, copper and steel for manufacturers of items identified as Class A products, to be available shortly.

Discrimination—CMPR 1, Interpretation 1: Clarifies regulations which prohibit producers of controlled materials from discriminating between customers in rejecting or accepting orders filed after deadline or which call for deliveries of less than minimum mill quantities, issued March 8.

End Products—M-1-i, amended: Authorizes companies receiving CMP allotments of aluminum to use metal for a specified group of end products, issued March 10.

Economic Warfare

Exports — Decentralizes certain phases of export control for commercial shipments to other American republics. Provides for establishment of agencies by each of the other American republics to receive requests from their importers for authorization to obtain United States articles and materials.

Service Regulations

Contracts—Under secretaries of the War and Navy Departments issue joint regulation defining the exemption of certain types of war contracts from provisions of the war-contract renegotiation statute including crude oil not processed or treated further than customarily occurring at the well.

Improved Yields From TCC Process

by J. P. O'Donnell

STEADY improvement in the field of catalytic cracking is being attained under the stimulus of wartime demands even though comparatively few of the plants employing such processes have been completed since the United States entered the war. This progress has been sufficiently rapid that estimates of the quantity and quality of the products are being revised upward before the plants have been completed. Security reasons prevent a full discussion of the developments that have resulted in this progress but it may be said larger yields of better 100-octane aviation gasoline base stock than expected will be available from these units.

Evidence of this improvement is contained in announcements relating to the Thermofor catalytic cracking (TCC) process developed by engineers of Socony-Vacuum Oil Co., Inc. The development of this process was first publicized in The Oil & Gas Journal of June 4, 1942. At that time it was said: "Yields of 35 to 45 per cent of 400 end-point gasoline may be obtained on a once-through operation and from 50 to 60 per cent on a recycling operation." Recently it has been stated that yields of motor gasoline up to 62 per cent are now obtainable on the once-through operation and up to 85 per cent on recycling. These higher yields are said to be accompanied by a considerable improvement in the quality of the gasoline. Data regarding yields were given in a paper before the American Petroleum Institute in November by T. P. Simpson, L. P. Evans, C. V. Thornberg and J. W. Payne of Socony-Vacuum. (See The Journal, November 12, 1942, page 96.)

New process techniques which have been developed since the original announcement of the process have resulted in improved yields from the standpoints of volume and octane rating. In addition the yields of products for alkylation are reported to be sufficient to constitute a good portion of the required blending material for raising the base stock with tetraethyl lead to 100-octane. Additional departures from earlier practices which will result in still further improvement are reported to be imminent.

As of March 1, 1943, 18 TCC reactor and kiln (regenerator) elements were in process of construction. Each of these units is capable of handling 10,000 bbl. of gas oil per day for the production of motor gasoline, an aggregate of 180,000 bbl. per day throughout. These units are being installed by nine companies as follows: Magnolia Petroleum Co., Gulf Oil Corp., General Petroleum Corp., Pure Oil Co., Socony-Vacuum Oil Co., Inc. (Lubrite division), Continental Oil Co., Ashland Oil & Refining Co., Crown Central Petroleum Corp., and Sinclair Refining Co.

The ferrous metal requirements for an entire plant are comparatively small. A unit designed to charge 10,000 bbl. per day for the production of motor gasoline requires approximately 1,800 tons of steel, iron and alloys. This amount is divided almost equally between the catalytic section and the distillation section. The horsepower requirements for circulating the catalyst and supplying air for regeneration of the cataylst in a unit of this size amount to only 235.

Excess Steam Generated

One desirable characteristic of the TCC process, it is claimed, is the generation of excess amounts of 450 lb. and 150 lb. steam which is available for use in other processing operations. This high pressure steam is generated by conversion of excess heat obtained in the catalyst regeneration. It is estimated that approximately 35,000 lb. of 450-lb. steam and 10,000 lb. of 150-lb. steam per hour will be generated in units charging 10,000 bbl. per day. In the operation of the catalytic cracking unit itself, approximately 10,000 lb. of 25-lb. steam per hour are required for process stripping with other steam requirements being limited to the pumps. The excess available for other operations depends on the power steam balance.

Thermofor catalytic cracking units have been designed in three sizes: 2,500 bbl., 5,000 bbl., and 10,000 bbl. per day. In addition, units chargin 15,000 bbl. per day are projected. While these or intermediate sizes would probably meet the requirements of a majority of refineries it i possible that units of considerably smaller size may be made available for smaller refineries. This possibility is indicated by the fact that the semicommercial pilot plant in which the process was developed at the Paulsboro, N. J., refinery of Socony-Vacuum has a capacity of from 400 to 500 bbl. per day, the variation depending on the character of the end product desired.

Parallels Thermal Development

If the small plant at Paulsboro does indicate that catalytic cracking may be economically applied to very small refineries this will parallel early development of thermal cracking during which many small capacity units of 500 bbl. per day or less were constructed. Many of these units are still in operation and there are numerous refineries in the United States equipped with thermal-cracking capacity of 500 bbl. per day or less. Approximately 65 refineries in this country have 1,000 bbl. per day or less thermal-cracking capacity. These capacities indicate the scope of the field open to a catalytic-cracking process which is applicable to small refineries.

Including the 18 TCC units, there are about 50 moving-catalyst type cracking units being installed in this country. Since units are all designed primarily to contribute to the war program they are being installed at refineries where capacities are sufficiently high to insure maximum production of needed products. Charging capacities of the largest are in the neighborhood of 15,500 bbl. per day and the smallest, 3,000 bbl.

Price Ceilings to Be Cut On Synthetic Rubber

WASHINGTON, D. C. — Lower prices for synthetic rubber become effective April 1, it was announced here last week by Prentiss M. Brown, price administrator. Reductions range from 2 cents per pound, in the case of butyl rubber, to 20 cents on neoprene.

New prices per pound, effective April 1, and the higher current prices which would be replaced, follow:

	New	Present
Buna-S	$0.36	$0.50
Butyl	.33	.35
Neoprene	.45	.65

North Texas Association Cancels Annual Meeting

WICHITA FALLS, Tex. — This year's annual meeting of the North Texas Oil and Gas Association, scheduled originally to have been held March 6, then postponed until March 13, has been cancelled, it was announced here this week by Fred Sehmann, vice president. Inability to engage satisfactory speakers and entertainment was given as reasons for canceling the meeting.

Gas Industry Coordinates Research Under Unique New Institute

by Arch L. Foster

A GROWING consciousness of the imperative need for more research and its coordination for the good of the whole industry has led the American gas industry to undertake a greatly amplified program in the fundamentals of gas technology. Applied research on problems of production, transmission, storage, manufacture, utilization and measurement, in the collection and dissemination of scientific information on gas and in the coordination of research by and for the industry are the objectives. This program is centered in and headed by the Institute of Gas Technology, affiliated with the Illinois Institute of Technology—formerly Armour Institute of Technology—in Chicago.

This new institution is the outgrowth of the increasing conviction in the minds of the gas industry's leaders that the best insurance against the future and for the welfare of that industry lies in research to provide means and methods of meeting the demands of a progressing civilization and to provide them before they are needed.

"The gas industry cannot be served effectively by that type of research which consists solely in thinking up ways to take the other fellow's markets away from him," Harold Vagtborg, first director of the institute, stated in discussing the purpose of the organization. "The basic research which leads to fuller and more advantageous utilization of our natural resources creates wealth . . . and this is the research which has always produced lasting benefit to its parent industry."

Selection of Students

In the course of prosecuting its program, the institute becomes also a trainer of graduate students, researchers in gas technology. Students selected from the senior classes of the various technical schools of the country on the basis of accomplishments and scholastic record are appointed each year to undertake various research plans. Only 15 students may be selected and added to the group each year. The unique advantages in the institute's program and curriculum have already made it a preferred agent among students for the continuation of their educations in a practical manner and competition is already very high to obtain one of the 15 "places" in the research body.

The institute combines original research with a specially selected curriculum of study leading toward the master's and doctor's degrees, the first requiring 2 years' work, the doctorate 4 years. Under its agreement of affiliation with the Illinois Institute, the Gas Institute maintains its own faculty and manages its own made-to-order curriculum; degrees are granted by Illinois Institute upon certification and approval to the dean of the graduate school. Only graduates—bachelors or higher—of top-ranking schools are eligible to appointment on the Gas Institute's student staff. Fundamental principles of chemistry, engineering and technology are stressed in the curriculum, and research projects serve to illustrate the application of such fundamentals to practical

Left: Entrance to the Institute of Gas Technology, a one-story, brick-and-glass structure, which houses the rapidly expanding work of the organization. Below: A section of the analytical laboratory where research problems will be studied and where work pertaining to other projects will be done.

problems or to extend knowledge in the study of gases.

Student researchers become fellows in the institute, receiving a stipend for their work which is adequate to defray their necessary expenses during the course. In the summer interim, fellows are expected to obtain practical experience from employment in the gas industry, a plan which broadens their experience and sharpens their outlook on the problems and methods of the industry.

In general, the institute plans to develop research men qualified to direct and carry on individual research programs, for individual companies. It strives to provide competent engineers qualified to direct manufacturing, transmission and other large-scale work of the industry and to apply the results of research and process development to practical problems. Students are specifically trained in handling and administration of the gas industry's business involving technological developments. Fundamentals are stressed, and the curriculum so chosen as to peculiarly fit the student for his work in a way not duplicated in any other institution.

Papers and theses based on the results achieved in student research activities will be published, as a general rule, and made available to the industry and to institute members. Institute-sponsored projects, dealing with the application of fundamental data and principles to specific industrial problems, available to members of the institute, may or may not be published. Individually sponsored projects will be directed generally to the solution of an individual problem or problems of special interest to the sponsoring company, and results will be available only to that concern. Sponsored projects will be financed by the company or companies instigating them; general projects will be supported by the institute from funds supplied annually by its members.

Some 50 member companies are on the roster at present and others are expected to affiliate as the work of the Institute becomes more widely known and its value better understood. Each member contributes a sum equal to 1 per cent of its net income during the preceding year. It has been pointed out that in most of the more successful industries the companies expend for research an average minimum of 2 per cent of their individual incomes. The total income of the natural and manufactured-gas industry is estimated at a conservative figure of 1 billion dollars in 1941, which would indicate a research expenditure of 20 million dollars, equal to the sum total spent for research in 1941 by only 15 of the major oil companies. It is obvious that these companies realize the value of research and that therefore the gas industry can afford to appropriate many times the amounts spent in past years for the same purposes.

Direction of research at the institute is in the hands of Dr. F. W. Sullivan, Jr., who has had wide experience in petroleum and gas research work, having been for several years research director for one of the largest oil companies. He supervises all research work and problems. Work for the doctor of philosophy degree must be an original and independent contribution to scientific and technical knowledge, carried out with a minimum of faculty supervision, guidance and advice.

Dr. L. R. Thiesmeyer is student counselor, directing the course of study of the institute and correlating this phase with the research work.

One of the major lines of study by the institute is that of utilization of gas byproducts, including catalysis. Methods for using gas as raw material for synthetic rubber, plastics, solvents, explosives and organic chemicals and other synthetics are under investigation. Much of the current work deals with emergency problems incident to winning the war and the plans of the institute have been rearranged to meet this situation.

The first sponsored-research project

Above: Student William R. Johnston wrestling with a tight valve on a gas line, in this instance not at the laboratory, but in the field in Colorado. Right: Student Stan E. Florin adjusting a Junker calorimeter preparatory to gas analysis.

assigned to the institute came from the Rochester Gas & Electric Co. This project is investigating the removal of organic sulfur impurities from gases. The company's president, Herman Russell, had a large part in the establishment of the institute. On this project the Institute has the advice of Alexander M. Beebee, gas department general superintendent; R. E. Kruger, manufacturing superintendent, and Louis Shnidman, laboratory director.

Methods for analysis of organic-sulfur compounds in gases are being studied in a project sponsored by the organic sulfur subcommittee of the American Gas Association. The subcommittee functions under the chairmanship of Dr. E. W. Guernsey, Consolidated Gas & Electric Co.

The Chemical Industries Branch, Office of Production Research and Development, War Production Board, under the chairmanship of Dr. D. B. Keyes of the University of Illinois, is sponsoring research on the chemical reactions of natural-gas hydrocarbons. Several other projects which are under way are confidential in scope and sponsorship.

Unit Operation Recommended By National Resources Board

WASHINGTON, D. C.—A recommendation that unit operation be adopted as a petroleum and natural-gas conservation measure was made by the National Resources Planning Board in its annual report. The report was submitted to Congress by President Roosevelt late last week.

Regulation of drilling since December 1941, which was instituted by a War Production Board order restricting spacing of wells, constituted, according to the board, "an important step toward a more thorough conservation of petroleum resources."

With regard to unit operation, the board recommended that it should be introduced for all new pools and all old fields requiring repressuring.

The board praised the more efficient use of petroleum brought about by improvements in consuming equipment and the greatly expanded manufacture of high-octane motor fuel, which will make possible the use of smaller motors in automobiles.

The board referred to demands by the synthetic-rubber industry for expanded production of carbon black, stating that "if the wasteful methods of production of this essential component of rubber tires are allowed to continue, it is possible that the consumption of gas for this use alone will exceed the consumption for all residential units."

It is possible, the board pointed out, to take such advantages of available processes that the use of gas can be reduced to only a fraction of present levels. The board went on record as favoring sharp restriction of interstate transmission of natural gas for power-plant consumption and other low-grade use.

Postwar reduction of gas consumption was viewed as a possibility by the board, owing to depletion of natural-gas reserves in the Appalachian area, and to a lesser extent in California, unless other steps are taken. One such step. the board recommended, would be connection of the areas by trunk lines to the Gulf Coast and Mid-Continent fields. The board intimated that projects of unprecedented size will be required. Government supervision of such projects was advocated by the board to promote efficient transmission and to assure equitable distribution among consuming areas. The board expressed the feeling that operation of the lines either as common carriers or as government projects would be the most effective means of preventing unfair discrimination.

The board also advocated promotion of underground storage of natural-gas near consuming areas and construction of facilities for storing liquefied gas aboveground.

Ickes Refuses Plea of Western Pennsylvanians

WASHINGTON, D. C.—Petroleum Administrator Harold L. Ickes late last week refused to lift the ban against pleasure driving and to increase gasoline allotments in 25 counties in western Pennsylvania. He explained that he had examined the situation thoroughly and studied carefully the part that the western Pennsylvania area plays in the wartime transportation of fuel supplies to the East Coast, and that these studies convinced him that there was no justification for making an exception for this section.

Oil operators, congressmen and others in the district made a plea some time ago that the district be separated from the 17 eastern states in the rationing plan. Shortly after announcing his decision, Mr. Ickes disclosed in a letter to Pennsylvania congressmen that about April 15 he would "look at the situation again."

Senator Guffey of Pennsylvania made sharp protest at the decision, declaring that Mr. Ickes had listened to and been guided by Ralph K. Davies, deputy petroleum administrator, and that the latter should be replaced by "some more practical and less biased man."

Public Aware of Real Cause of Oil Shortages

NEW YORK.—A majority of the public appreciates the reasons for gasoline and domestic fuel-oil shortages in the East and is accepting this unavoidable inconvenience of wartime uncomplainingly and in a spirit of patriotic cooperation. This conclusion is indicated by a spot survey recently completed by Standard Oil Co. (New Jersey).

In answer to the question, "Who do you think is to blame for the general gasoline and fuel-oil shortage on the eastern seaboard," the most frequent answer, given by 34.8 per cent of the people replying, was "the war, Hitler, and general conditions brought about by the war."

Answers from 17.1 per cent attributed the shortage to lack of tankers and railroad tank cars. Another 3.7 per cent considered lack of sufficient pipe lines as the chief cause. Thus slightly more than 55 per cent blamed the war or transportation difficulties arising from it.

A.P.I. Pacific Coast Program Features PAW Operations

LOS ANGELES, Calif. — Program for the "Wartime Conference" of the Pacific Coast district, Division of Production, American Petroleum Institute, to be held at the Los Angeles Biltmore, March 23, has been announced by Carlton Beal, Richfield Oil Corp., program chairman.

Chairmen of the industry committees for District 5 will take part in a symposium devoted to an explanation of the most recent procedure for scheduling California's wartime crude-oil production. The entire program will follow a dinner at 6 p.m.

Guest speaker will be Herbert R. Gallagher, director in charge of the District 5 office of the PAW.

Chairman of the conference will be E. K. Parks, chairman of the A.P.I. Pacific Coast Division of Production. Chairman of the arrangements committee is C. M. Rader, assistant general manager, Kobe, Inc. L. George Trembley, vice president of Howard Supply Co., is in charge of ticket sales.

Steel Tubing Industry Advisory Committee Formed

WASHINGTON, D. C.—Ten executives experienced in the steel tubing industry were invited by Price Administrator Prentiss M. Brown last week to serve on a steel tubing advisory committee to counsel with OPA on pricing problems of the industry.

Four advisory committees are serving as liaison groups between the OPA and the steel industry, and the tubing committee is a fifth. It will consider present and future problems arising in connection with steel tubing under Revised Price Schedule 6 on iron and steel products.

Those invited to serve are: J. Ireland, Republic Steel Corp., Cleveland, Ohio; R. Lawson, Summerill Tubing Co., Bridgeport, Pa.; E. A. Livingston, Babcock & Wilcox Tube Co., Beaver Falls, Pa.; W. F. McConnor, National Tube Co., Pittsburgh, Pa.; William A. McHattie, Michigan Seamless Tube Co., South Lyon, Mich.; Charles E. Miller, Michigan Steel Tube Products Co., Detroit, Mich.; W. B. Moore, Timken Roller Bearing Co., Canton, Ohio; F. J. O'Brien, Globe Steel Tubes Co., Milwaukee, Wis.; H. E. Van Huffel, Van Huffel Tube Corp., Warren, Ohio, and Aaron Waines, Ohio Seamless Tube Co., Shelby, Ohio.

Stripper-Well Survey to Be Brought Up to Date

OKLAHOMA CITY, Okla.—The national stripper-well survey will be brought up to date with 1942 data as one of the features at the spring quarterly meeting of the Interstate Oil Compact Commission at the Allis Hotel, Wichita, Kans., April 2-3.

Another feature will be motion pictures showing the benefits of modern conservation practices in the production of petroleum.

Colombian Production Continues to Decline

NEW YORK.—Production of crude oil in Colombia declined to the lowest point of the year in December when it averaged 6,074 bbl. per day against 6,131 bbl. in November, the previous low for 1942. December's rate of production contrasted with the peak of 83,428 bbl. reached in February, an all-time high.

The decline in Colombia's production last year resulted from German submarine activity in the western Atlantic and Caribbean. Colombia's two oil ports, Mamonal and Covenas, both are on the Caribbean and the bulk of its exports were consigned to Canada, Aruba, and the United States.

Total Colombian production for 1942 was 10,588,000 bbl., a daily average of 29,000 bbl. This compared with a total of 24,639,000 bbl. produced in 1941 when it averaged 67,500 bbl. per day. The 1942 output was the lowest for the country since 1926 and was 60 per cent less than the record 25,565,000 bbl. produced in 1940.

A record of Colombia's production for the past year follows:

Month—	Total	Dly. av.
January	2,213,000	71,387
February	2,336,000	83,428
March	1,296,000	41,806
April	1,072,000	35,733
May	1,121,000	36,161
June	786,000	26,200
July	467,000	15,064
August	379,000	12,226
September	348,002	11,600
October	197,799	6,381
November	183,938	6,131
December	188,285	6,074
Total 1942	10,588,024	29,008
Total 1941	24,639,000	67,504
Decline	14,050,976	38,496

Alberta Supreme Court Upholds Conservation Act

CALGARY, Alta. — The Supreme Court has upheld the validity of the Alberta conservation measures, including a rule that only one well may be drilled on each 40 acres in Turner Valley. The judgment arose from an action against the Petroleum and Natural Gas Conservation Board by William J. Rowley of Calgary, who was refused permission to drill on a 20-acre lease in North Turner Valley.

Navy's Fuel-Oil Needs Average 208,000 Bbl. Daily

WASHINGTON, D. C.—The Navy's fuel-oil requirements will increase from 76,000,000 bbl. in 1943, a daily average of approximately 208,000 bbl., to 98,000,000 bbl. in 1944, about 268,000 bbl. daily, it was disclosed here last week. Navy officials reported that the drain on supplies available to civilians will be greater than in 1942.

Oil-Truck Drivers Exempt From WMC Transfer Order

WASHINGTON, D. C. — United States employment offices have been instructed by the War Manpower Commission not to attempt to transfer truck drivers and maintenance mechanics employed by distributors of fuel oils and solid fuels to war industries or other essential jobs. Although fuel distribution is not on the official national WMC list of essential activities, fuel shortages in some parts of the country, which have been aggravated by lack of drivers and mechanics, prompted the commission to take this action, Paul V. McNutt, chairman, said.

American Liberty Sells Properties to Atlantic

FORT WORTH, Tex.—American Liberty Oil Co., Dallas, Tex., last week sold 1,000 acres and 25 wells in Yoakum and Ector counties, West Texas, and Lea County, New Mexico, to Atlantic Refining Co. for a reported consideration of $1,113,000 in cash plus overrides. Eighteen of the wells are in the Wasson pool, four in North Cowden and three in the Penrose (New Mexico) pool.

DEATHS

George B. Williamson, 59, chief engineer at the Franklin pump station of Ohio Fuel Gas Co., died last week.

J. W. Gardner, 70, who was associated with Gardner-Denver Co., Quincy, Ill., from 1881 until ill health forced him to withdraw from active participation in business several years ago, is dead. Mr. Gardner assumed active management of the plant in 1905, and during his period of management, served as president, chairman of the board, and finally as chairman of the executive committee.

Merrill N. Davis, 57, executive vice president of Dresser Manufacturing Co., died March 6 at Bradford, Pa. Death was attributed to a heart attack. Mr. Davis joined Dresser as sales manager and successively became vice president in charge of sales and executive vice president. His widow, a daughter and a son survive.

Franklin Homer Groves, 80, who retired from Pure Oil Co. 4 years ago after more than 20 years of service, died at his home in Tulsa last week. His widow and two daughters survive.

Lorenzo Nolley Dantzler, 76, who was president of L. N. Dantzler Lumber Co., Moss Point, Miss., for many years, died February 27. His company controls some 400,000 acres, parts of which, from time to time, have been under lease to practically all of the major oil companies, and many others. A son survives.

Fred H. Hungiville died recently in a Bradford, Pa., hospital, death being attributed to a heart attack. Mr. Hungiville had been actively engaged in the oil-producing business until a few years ago. His widow and a son survive.

Frank M. Hullihen, 71, oil-field worker for nearly a half century, died in a Bradford, Pa., hospital recently. He retired last November, his last position being with Wilson & Fitzgibbon. Three sons survive.

Water Production Creates Corrosion Problems in Western Kansas

by Neil Williams

Increasing water production in western Kansas fields is presenting additional difficulties for operators in combating corrosion. Special practices are being adopted for controlling the water and protecting equipment. In this article are discussed some of the conditions as they pertain to these practices.

UPWARDS of 90 per cent of the oil production of western Kansas is from the Arbuckle lime. This area is defined as being west of the sixth meridian, running through a point between Wichita and Hutchinson, and contains many of the more important and newer fields of the state. The Arbuckle has a very active water drive and is a large producer of water. Usually, water shows up early in a well, frequently at completion or before a well has made more than 10,000 to 15,000 bbl. of oil. Since the total oil recovery of an Arbuckle well on 10 acres seldom is more than 200,000 bbl., the average being 125,000 to 150,000 bbl., water production is a major consideration in the recovery.

Many fields and wells have reached a stage where water constitutes a sizable proportion of their production. Typical are Chase, Rice County, Silica, Rice and Barton counties, and Trapp, Barton and Russell counties. Active development of these fields took place from 1931 to 1937. Oil production in many instances now is approaching depletion, so that it is not uncommon for wells there to make as much as 95 to 97 per cent water. Small wells not capable of making the minimum allowable sometimes are called upon to lift as much as 600 bbl. of fluid to obtain their maximum recovery. Fortunately, due partly to the fact that the producing depth is only about 3,200 to 3,250 ft., wells in many cases can make up to 99 per cent water before reaching their economic limits.

Water encroachment in these fields was hastened by the relatively high rates at which many wells were produced during their early lives. Wells drilled when these fields were developed generally were completed with large-sized tubing and pumps and heavy pumping equipment with a view toward handling large volumes of fluid. Particularly during taking of potentials, which were based on capacity pumping tests over a 24-hour period, wells were pulled on heavily. During tests it was customary to pump with strokes up to 54-in. long and at speeds of 48 to 50 s.p.m. to get the highest potential possible. This drew water in rapidly, accentuating natural encroachment. With depletion of the oil it has been necessary to lift increasing volumes of water.

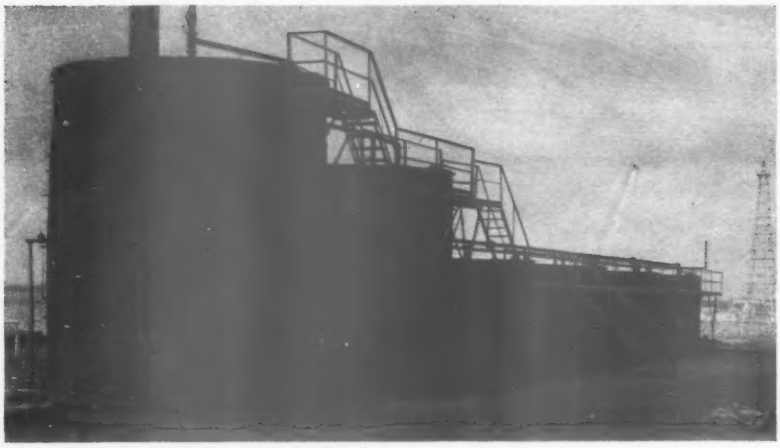
Draw-Down Tests Prove Help

With adoption in Kansas within recent years of the draw-down method of determining well productivity (The Oil and Gas Journal, Jan. 7, 1943, p. 119) involving calculations based on slow rates of withdrawal, there has been less occasion for capacity pumping in the newer development. Along with this, the trend has been toward the use of smaller tubing, pumps and pumping units with consequent reductions in rates of withdrawal. As a result, in the newer development water production has been retarded, but at best it has not been possible to prevent a steadily greater volume of water being produced. Higher well allowables within recent months that have been occasioned by the urgency for additional production to meet war demands have forced boosts in rates of withdrawal that have resulted in substantially increased water production in many cases.

Water production has become one of the biggest problems facing western Kansas operators. Not only must the water be disposed of, but Arbuckle water is highly corrosive and necessitates the adoption of special practices and facilities for handling it and producing the wells. Corrosion has been a problem from the beginning but the effects of corrosion are being made more serious by the greater volumes of water that now must be lifted. For this reason the problem is receiving increasing attention. It is particularly important at this time in view of the difficulties of replacing corroded equipment. Also, as the oil recovery from the wells declines and approaches depletion, resulting in reduced returns, it becomes more essential to minimize loses and well maintenance costs incurred by corrosion that the economic limit of production might be delayed.

The problem of disposal of the increased water production also is receiving greater consideration. Corrosion is a phase of this problem. The disposal problem, however, will be discussed in a subsequent article. This article is particularly concerned with the practices and means being devloped for combating corrosion. It has been possible to provide protection against corrosion at many places but the problem of complete elimination of trouble from this cause remains to be solved.

Corrosive water comes from two main sources, the Arbuckle lime and the Dakota sand. Many leaks that have developed in casing are attributed to Dakota water which attacks the casing from behind, and then gets into the well through leaks and adds



Corrosion, which has taken a heavy toll of metal equipment, is causing many western Kansas producers to turn to wooden gun barrels and field tanks as shown here.

to the volume of water being produced from the Arbuckle. In the area involved, the Dakota sand is found at depths ranging from 200 ft. to about 1,000 ft. In many wells the sand is not adequately cemented off. Most of the casing failures due to Dakota water corrosion are in the oldest wells, principally in the cable-tool holes. Practice for some time has called either for setting the surface casing through the Dakota sand and cementing this pipe to above the sand, or else perforating the oil string above and below the sand and squeezing cement behind the pipe through the sand. Few wells so cemented have had any trouble from the Dakota water. In the older wells, however, increasing numbers of casing failures are now being experienced, which may be because these wells are reaching an age that the effects of the corrosion, going on over the years, have had time to show up.

Water Has Hydrogen Sulfide

Protection from the Dakota water is a matter of well repair to shut out the water. Arbuckle water, however, is another matter. It comes with the oil production and must be handled. Most operators make frequent analyses of the water produced to determine the presence of any Dakota water, which would indicate a leak in the casing. If leaks are found, and Dakota or other water is getting into the well, remedial work is attempted. Casing corrosion also may be caused by the Arbuckle water on the inside but unless outside water comes in, leaks would not be learned and would make little difference. The fact that tubing strings pulled from wells have been found badly corroded both outside and inside would indicate that casing strings in these wells are corroded in the same way at corresponding depths.

Arbuckle water, in addition to chlorides and sulfates has a substantial sulfur, and particularly, hydrogen sulfide content and acts rapidly on all metal equipment with which it comes in contact, both subsurface and surface. The life of a complete string of tubing or rods in contact with the water is less than 2 years, and replacements of parts of a string usually must be made at much more frequent intervals. Rods must be pulled often, sometimes two or three times a week for checking, and even then rod parting is common. Water in relatively small percentages and kept moving does not seem to give much trouble. The principal grief comes mainly when water is allowed to head up and stand for short periods of time. It seems also that the older a well becomes the more corrosive becomes its water.

By the practice of lowering tubing to place tubing perforations near the bottom of the well and pumping from the bottom, coupled with a practice of pumping at lower rates of withdrawal over longer periods, much has been done to reduce corrosion on the outside and behind the tubing. These practices have not reduced inside tubing and rod and pump corrosion.

High working-fluid levels have characterized Arbuckle production. Static fluid level usually is around 3,000 ft., from 200 to 250 ft. below the top. Saving on tubing and rod strings and reducing lifting costs, many operators were led to "skimming" the wells. Tubing and pump would be set high in the wells, usually around 2,700 to 2,800 ft., or high enough to place the pump intake in the oil portion of the fluid column after the oil and water had been allowed to find their static levels. In pumping periodically, particularly in the wells of larger oil capacity, this facilitated lifting of the oil alone and reducing water production. Also, as the pump intake usually was above the water column, corrosion on the inside of the tubing above the pump intake was lessened. This, however, allowed water to accumulate and stand in the well below the pump intake, increasing the corrosion of casing in that part of the hole and behind the tubing.

Thus, most operators have found it better practice to pump from the bottom of the wells, setting the tubing perforations and pump intake as near bottom as possible and lifting the water with the oil as it enters the well, preventing corrosion by static water in contact with the metal. In constant pumping with pump intake at the bottom, the water is kept moving with the oil, allowing it little time to settle and head up in the well.

Outside Corrosion Is Reduced

It has been customary in many cases in the past to pump wells at fairly high rates of withdrawal, getting the day's allowable in a few hours or the month's allowable in a few days, and then allowing the well to stand the remainder of the time. In long shutdowns the water has opportunity to settle and may head up as high as 1,000 ft. in the annulus behind the tubing, quickly causing pitting and leaks. The corrosion was made worse by the fact that during each pumping period the old water in the hole was replaced with new water. Corrosive action of the water tends to weaken the longer the water stands, but with replacement with new water accumulations during periodic pumping the corrosive action is revived.

An advantage of constant pumping is that the water level behind the tubing is lowered and the column there replaced with oil which protects the back of the tubing. Water usually is replaced with oil within 24 hours after start of pumping. Consequently, in such pumping with tubing and pump intake low and water lifted as it comes into the hole there is little below and back of the pump intake to become exposed to standing water. In most wells the casing is cemented up as much as 400 ft. on the outside, so even if the pipe becomes corroded in the bottom up to that depth no particular harm would result.

Some operators attempt to protect the outside of the tubing in the well and the casing above the pump intake by means of sealing off the annulus with packers at the bottom and filling the annulus with oil. This does the job when the packers work properly, but often the packers give trouble, especially when pulling tubing. Also, while the back side of the tubing may be protected, the tubing still is being eaten out on the inside.

Conditions have been conducive to the use of insert or rod pumps. These have worked to advantage both to slow up the rate of fluid withdrawal and retard water encroachment, due to their smaller fluid handling capacity as compared with tubing pumps, and to facilitate pulling and mainte-

nance, as such pumps are pulled with the rods. Sizes of these pumps range from 1½ to 2 in.

Combating of corrosion inside the tubing has involved numerous complications, and as yet no answer has been found for the problem, a number of operators lately have been experimenting with cement-lined tubing. In this, although the tubing is protected, wear on rods is great and more frequent breaks result. Rods can be worn completely in surprisingly short time by the cement. Rod guides of various materials and types have been installed on rod strings to protect the rods, but these can be little larger in diameter than the rod couplings, and also soon wear too small to do any good. Also, some types jam up in the hole and cause trouble in pulling rods. Major benefits have been derived in the past by use of rods and couplings of high nickel content and having other corrosion resistant alloys and qualities, but such rods now are almost unobtainable. As operators resort to rods made of less adaptable materials, corrosion becomes a more serious matter.

Use of Tapered Rod Strings

Some good is resulting from use of tapered rod strings. The combinations run usually consist either of ⅞-in. and ¾-in., or 1-in. and ⅞-in strings. The larger size in each case is run on the bottom where exposure to water is greater. It stands more corrosion or wear before breaking and requiring replacement.

On the surface, operators are going almost 100 per cent to asbestos-cement pipe for lead lines, and all other lines in which any water is handled. In the former use of steel pipe, leaks became frequent, and most lines had to be completely replaced in from 1 to 2 years. No high pressures are involved so the asbestos-cement type of pipe is strong enough. In some cases operators have devised couplings, bends, "T's" and other fittings made of concrete, using about 50 per cent cement and 50 per cent fine sand.

Particular trouble also is experienced in gun barrels and tanks, although some operators are getting around this by the use of wooden batteries, or at least wooden gun barrels, replacing the equipment where most of the corrosion would take place. More and more replacements are being made with wood, although many operators still prefer to use steel tanks if it is possible to do so. When steel is used it is necessary to coat the interior of the tanks with some corrosion-resistant material or paint. Otherwise, the life of a tank, like that of metal lines or well equipment, is not more than 1½ to 2 years. Objection to wooden tanks in the past has been that they have required too much attention in being kept tightened and that they have had to be kept watered on tops and sides to prevent cracking and leaking. Several operators, however, have had wooden tanks in use for some time without watering and they have given little trouble. Some installations have been made with insulated tops and false coverings that have protected the tanks without watering.

Chemical Treatment of Wells

Chemical treatment of the water in the wells as it is produced to neutralize the corrosive action has proved effective in many instances. The chemical mixture and the method of treatment in these cases was developed by Cities Service Oil Co. which not only is treating a number of its own wells but also some of other companies. The chemical mixture contains a concentrated caustic soda with colloidal material (tannic acid). Caustic soda is the neutralizing agent but if injected without the colloidal agent to retain the water solids in suspension it might cause the solids to precipitate and accumulate around the pump intake and clog the well.

The chemical is injected into the annular space through an opening in the well head. In wells that are pumping fairly constantly, the injection is at a very slow, steady rate, amounting to about 2½ to 3 gal. a day for a production of from 200 to 250 bbl. of water. The injection for the wells is in thimble-sized quantities at time by means of a special mechanically operated device, consisting of a small endless chain which moves over a sprocket wheel at the top into a 100-gal. chemical container set up at the well. A thimble-sized bucket fastened on the revolving chain lifts the chemical picked up in the container and in moving over the sprocket at the top empties into a drip line which feeds by gravity into the well-head opening. The rate of injection is varied by the number of small buckets on the endles chain, although one usually is sufficient. In the course of a day, one of these thimble-sized scoops will lower the chemical level in the 40-in. high, 100-gal. drum approximately 1 in., which is the equivalent of about 2½ gal. On rig-front pumping installations, the sprocket turning the endless chain in the chemical drum is operated by a small shaft attached as a side extension to the band-wheel shaft. This necessitates the location of the drum at the side of the rig front adjacent the band wheel.

On those wells which are shut down for fairly long periods, the chemical is injected manually, about 2½ to 3 gal. twice a week being run into a well which averages from 200 to 250 bbl. of water daily. The amount of chemical and the interval of injection is varied according to needs. For this, the chemical drum is set up near the well in a permanent installation with a small sized gravity feed line connection to the well-head opening. To treat the well, a small faucet in the fed line is opened until the desired amount of chemical is run in. While the well is standing, the chemical precipitates through the fluid column in the annular space neutralizing the corrosive elements.

The chemical treatment has not been recommended for wells making very large volumes of water. It usually is not considered advisable to treat wells making more than 350 to 400 bbl. water daily. Also particular care must be taken not to overtreat the water. Costs in some cases also might be too great to justify the treating. Treating calls for frequent and more or less regular tests of the water to check the results of the treating so that the use of chemical can be adjusted to the needs of the well.

Economical Orifice Meter Installation

ORIFICE meters, flanges, and accessories are becoming more difficult to obtain even upon presentation of high preference ratings. In usual oil-tank-battery practice, two meters are used, one for the lease separator and the other for the test separator.

It is possible to use one meter if an average of the daily lease volume is assumed sufficiently accurate upon test days. In using one meter it is, of course, necessary to have the separator vent lines close together.

Orifice flanges are best installed on the vent line drops from the top of the separator, and the separators are usually close enough together so that the vent lines may be installed within 3 or 4 ft. of one another. All batteries should be planned with care initially, because lack of foresight is eventually costly.

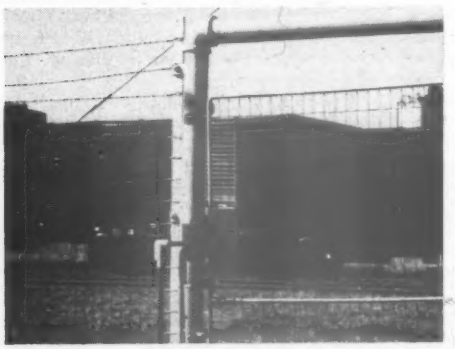
If the two orifice fittings are installed in the drops approximately 4 to 5 ft. off the ground, the metter can be clamped to the lease separator vent line just below the orifice flange. By installing a simple manifold of ¼-in. valves and ⅜-in. copper tubing (carried overhead approximately 7 ft. off ground) the single meter may be used for both orifice flanges. The orifice plates can be changed much more rapidly on vertical runs than on horizontal runs buried in the ground.

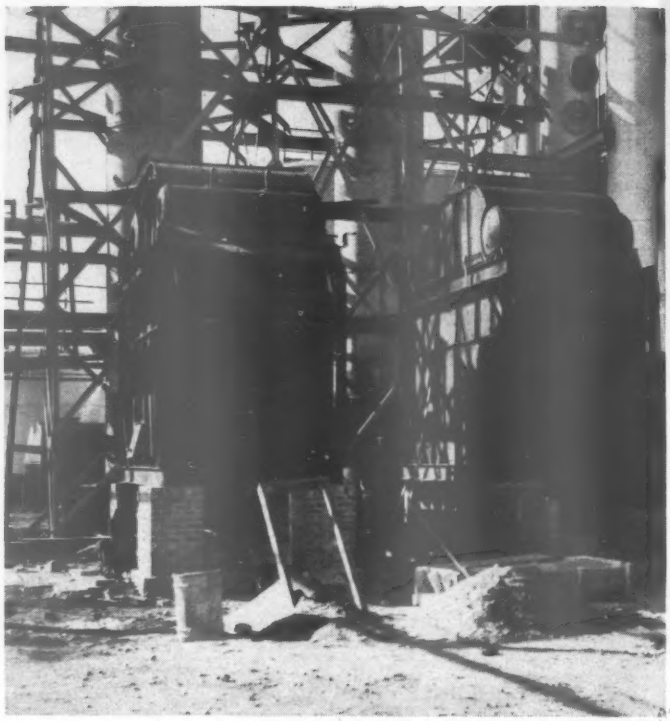
If weighted back-pressure valves or low-pressure regulators are to be used they should be installed in the horizontal vent near the meters so they can be quickly adjusted. If high-pressure regulators are required and heating must be employed to avoid freezing, the equipment should be placed at a safe distance from the other equipment.

PLANT PRACTICES

Remote-Controlled Gate Lock

SEVERAL gates in one Oklahoma refinery are located several hundred feet from the gateman's house at the main gate. Each is equipped with an electrically operated lock controlled by a switch in the gateman's house. At each gate is a push button with buzzer connection in the gate house by which a workman desiring to pass through the gate can signal the gateman. As the gates are within clear view of the gate house, the gateman can check on the workman and unlock the gate by the remote control. The lock is operated by means of a magnetic device which releases the latch.





Refinery Converts Oil-Well Boilers

TWO portable 80-hp. water-tube boilers formerly in oil-well drilling service are being converted to refinery use in an Oklahoma plant. They will be used as furnaces for direct heating in processing to relieve some of the load now being carried by steam. Increased heating requirements of the plant could not be met with steam without the installation of additional boiler capacity. New equipment for this purpose was difficult to obtain, and with regular furnaces for refinery use equally hard, if not harder, to get, the two used oil-field-service boilers were obtained. These are being installed permanently and will be walled and enclosed in brick.

Revolving Jig for Metallizing Small Shafts

A REVOLVING jig for turning small shafts being metallized was built from miscellaneous parts in the shop of a refinery in Kansas. It consists of two turning units, one in a fixed position at one end of a metal base while the other is adjustable to conform to the length of the shaft or rod to be metallized. The adjustable unit slides back and forth on the base, being guided by right-angle aprons which fit over the sides of the base. It is secured in desired position for operation by means of a hand screw. The shaft or rod to be metallized fits into coupling sockets in the ends of the axles of the turning units and is secured by set screws. The wheel for turning by hand was taken from an old valve. One man can lift the entire unit to any place desired. Most of the parts, particularly those comprising the turning unit, came from an old automobile. The jig facilitates metallizing the shafts more evenly.

Cooperating with Uncle Sam

Four independent refiners joined together in 1931 to build the world's first cooperative Dubbs-cracking unit Its purpose was to crack the oils from their respective refineries to the best advantage of all Universal designed it It was enlarged in 1939

Now those refiners have taken a fifth party into their cooperative set-up—Uncle Sam He wants 100-octane gasoline—and lots of it

To make constituents of 100-octane gasoline the refiners are spending more than a million dollars converting the unit to catalytic cracking Universal refining specialists are on that job, too

Says Oil and Gas Journal:

> When conversion work is completed the cooperative cracking unit will supply charging stock to a government-owned plant now being constructed on adjoining property for the manufacture of 100-octane gasoline

That's the kind of cooperation going on throughout the refining industry today

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Sullivan Compressors

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LOS ANGELES, CALIF. 2900 Santa Fe Ave.
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NEW YORK CITY, N. Y. 30 Church St.
PITTSBURGH, PA. 47 Terminal Way, So. Side
PORTLAND, ORE. 1631 N. W. Thurman St.
SALT LAKE CITY, UTAH 117 W. 2nd South St.
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SEATTLE, WASH. 3410 First Ave. South
ST. LOUIS, MO. 2639 Locust St.
WASHINGTON, D. C. 1427 I St., N. W.

Substructure under engines and compounding mechanism of a large mechanical rig in use at Barnhart, Tex. Center section is removable and is for spacing and for dividing substructure into two main sections for moving

SLIM-HOLE DRILLING

In Barnhart Field in West Texas

by Harry F. Simons

The slim-hole program followed generally in this field was inaugurated on the first well. Drilling conditions are reasonably severe. Some of the difficulties to be expected are reviewed here.

THE Barnhart field in Reagan County, Texas, is the first major deep pool in West Texas' Permian basin to be developed on a slim-hole basis. It indicates what may be expected of this development in the area and it also shows what some of the more common difficulties may be. Fortunately, drilling conditions might be described as reasonably severe.

The pool is owned almost entirely by the Amerada Petroleum Corp., which drilled the discovery well in August 1941. At the present time there are 13 wells completed in the pool, 1 dry hole, 2 abandoned locations and 6 drilling wells. The single dry hole is on the extreme southwest edge of the field and ran structurally low. Amerada owns 10 of the producing wells, Sharples Corp. owns one and Ogden & Hawn own two.

The field is being developed on 160-acre spacing with the locations being in the center of 40 acres which will permit later development on 40-acre spacing. The only exception is the Sharples 2, SE SW Section 3, Block 49, University Lands, Reagan County, which is currently drilling on a 40-acre spot on an 80-acre location. This will be the last well drilled on an 80-acre location until PAW changes its recently issued regulation specifying 160-acre spacing.

Slim-Hole Practice

To date the structurally highest well in the pool is Amerada 1-AR-C, which is 1 mile west of the discovery well, which is the second highest. Average depth of the producing formation (Ellenburger) is 9,099 ft. or 6,350 ft. subsea. Average total depth of the producing wells is 9,179 ft., although practically all were drilled about 50 ft. deeper and then plugged back. This gives a producing section of approximately 80 ft. from which an average initial production of 857 bbl. per well has been obtained.

The slim-hole program followed generally in the field was inaugurated on the first well which set 627 ft. of 10¾-in. casing, 2,225 ft. of 7⅝-in. casing and 9,017 ft. of 5½-in. pipe. The discovery well had over 7,000 ft. of open 6¾-in. hole before the oil string of casing was run in it. The string of pipe run to 2,225 to 2,250 ft. shuts off the salt section between 1,080 and 2,180 ft., the gas sand found at 2,200 ft. and eliminates considerable mud trouble. While drilling the hole for the intermediate string loss of circulation is not uncommon.

The drilling of a well to below 9,100 ft. with 7,000 ft. of open hole is something of an accomplishment and when the hole drilled is only 6¾ in. in diameter, a great amount of care must be taken to prevent troubles. The drill pipe used is 3½ in. in diameter and a stuck string of pipe is really difficult to free. It would be practically impossible with present mud technique to drill the well without casing off the salt, anhydrite and gas bearing zone mentioned above by running the intermediate string.

Formations below the intermediate

(Continued on Page 53)

DIFFICULT DRILLING PROBLEMS SOLVED WITH

MICATEX

One of the most difficult of all drilling problems is encountered in drilling through loose, creviced or fractured formations heavily charged with gas. Unless the drilling mud has adequate weight, the well may blow out. (See Fig. 1.) This weight which is necessary to hold the gas pressure may be great enough to cause loss of circulation in the permeable formation. (See Fig. 2.) Providing adequate mud weight to control pressures and not thereby lose circulation was an extremely difficult problem until MICATEX was introduced to the oil industry.

MICATEX seals the walls of the formation and helps prevent loss of circulation. (See Fig. 3.)

This ability of MICATEX to help prevent blowouts and lost circulation is proved in the following drilling problem encountered in the Gulf Coast. A well at 9447 feet struck a loose, high-pressured gas sand and attempted to blow out with a mud weight of 11.7 pounds per gallon (88 pounds per cubic foot). The mud weight was increased, but when it reached 12.2 pounds per gallon (91 pounds per cubic foot) circulation was lost. The well was shut in and MICATEX was added at the rate of 5 pounds per barrel to a pit of mud weighing 12.5 pounds per gallon (94 pounds per cubic foot). This mud was then pumped into the hole, and indications showed that circulation was re-established soon after the MICATEX-mud left the drill pipe. Weight was then raised to 13.8 pounds per gallon (103 pounds per cubic foot) with no further loss of mud.

The well was drilled to 9651 feet with no additional trouble. At this point casing was run and the operators reported that the well "was so satisfactorily walled-off that the pipe didn't touch a thing." During the cementing operation full mud returns were obtained the whole time the 16-pound-per-gallon slurry was being run, further indicating the ability of MICATEX to provide an effective mud seal and a clean hole.

MICATEX, and all the other Baroid Products, take troubles out of drilling.

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Fig. 1. Fig. 2. Fig. 3.

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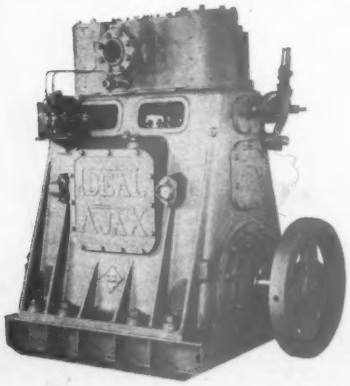

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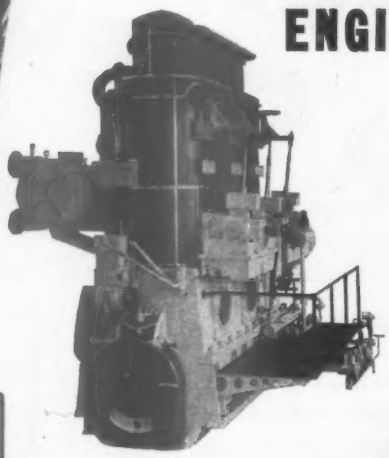

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THE NATIONAL SUPPLY COMPANIES IN EVERY FIELD

(Continued from Page 48)

string of pipe to the top of the Ellenburger are alternating shale, sands and limes of varying degrees of purity. (For log of formations see Journalog, Barnhart discovery, The Oil and Gas Journal, Mar. 19, 1942, p. 59.) There are comparatively few readily identifiable zones of any thickness and from the reports of drillers and those familiar with the pool, the correlation between wells is difficult. This is particularly annoying when outlining a bit program as a well will encounter types of drilling not found in previous wells. The driller must simply run the bit, watch it closely and rely mainly on his judgment to tell him replacement is needed.

Same Number of Bits

Strangely enough, wells drilled in the pool use practically the same number of bits, soft streaks compensating for the hard ones encountered in practically all cases. Average number of 6¾-in. bits required to drill below the intermediate casing point is 107 with the lowest number used being an even 100 and the highest 115. The hole drilled for the intermediate string runs from 9⅞ to 11 in. in diameter and from 6 to 10 bits are required for drilling this section, with the average being eight bits.

Incidentally, and it illustrates the previous statement that there is little relation in the drillability of the formations, the discovery well drilled by Rowan Drilling Co. used six 9⅞-in. bits for drilling the intermediate hole and 104 6¾-in. bits for drilling to the pay-string casing point. Normally, during the drilling of a field, the number of bits used is sharply reduced on later wells, whereas in Barnhart the reduction at best is only 4 per cent. A well currently drilling may better this, however.

Under the surface pipe the first three bits will run around 500 ft. after which there is a drop to around 200 ft. per bit. Below the intermediate string the average for the first 700 ft. is 110 ft. per bit. The next three bits to 3,250 ft. may average around 60 ft. per bit and this is followed by 1,500 ft. through which the average per bit is 100 ft. Generally the drilling rate drops off to approximately 73 ft. per bit for the next 600 ft. and to about 42 ft. per bit for the next 250 ft. which places the depth at 5,600 ft. The next 500 ft. requires eight bits for an approximate average of 64 ft. per bit. The 150 ft. below 6,100 ft. requires three bits, generally.

Below 6,250 ft. the drilling is through broken shale with mostly lime stringers and some sand for approximately 1,500 ft. with the bits averaging 54 ft. The succeeding 250 ft. to 8,040 ft. is rather hard lime through which 40 ft. per bit may be expected. The 650 ft. of broken shale and lime following require nine bits for an average of 72 ft. per bit. The next five bits average 36 ft. after which the formations soften a little.

Occasionally unexpected hard zones are found which cut the bits badly and may cause the loss of a cone. Quartizite and chert streaks may be encountered between 8,600 and 8,800 ft. In other cases, tough shales will not permit progress to be made. However, on the whole, the rate of penetration decreases rather gradually as the total depth is approached.

The cutting rates per hour, based on the hours run and the footage per bit is as follows:

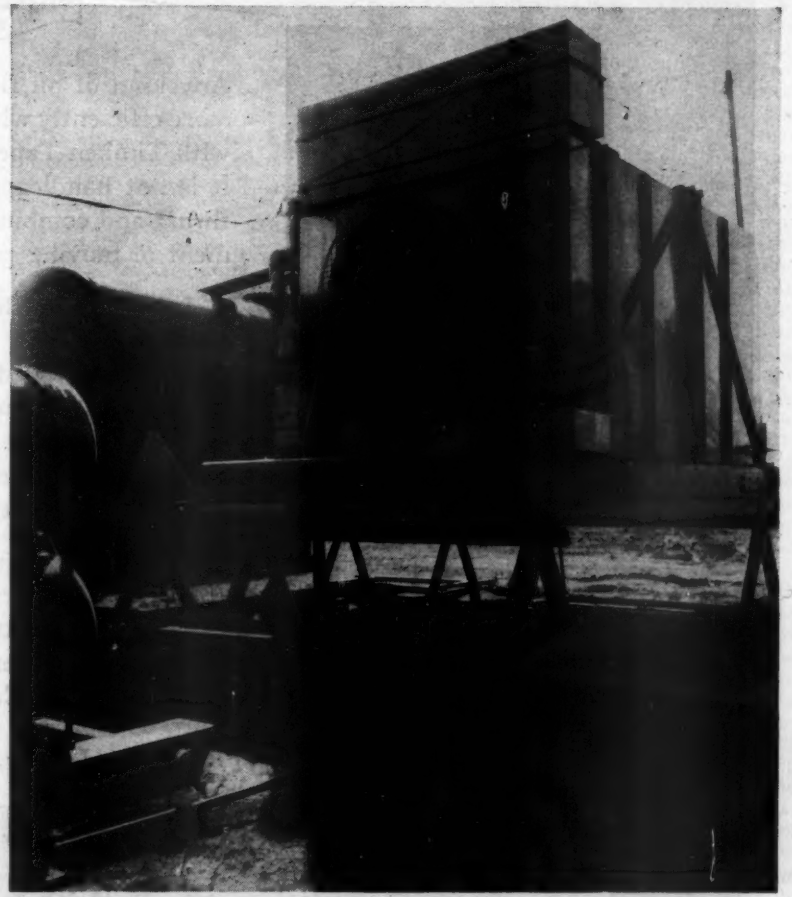
Cutting Rate Per Hour

Average		Depth	
High	low	From	To
14	10	2,870	4,761
8	4.5	4,761	5,354
6.5	5.5	5,354	6,102
5	4	6,102	6,244
7	5	6,244	7,798
4	3	7,798	8,043
6	4	8,043	8,690
3.5	3	8,690	8,874
4.5	4	8,874	9,100

The formations penetrated in the field are not unusually hard on the tool joints but this is partly due to the conditions of operation. From three to four wells are obtained with a string of tool joints, or from 21,000 to 28,000 ft. Rotary speeds are not excessive (around 100 r.p.m.), and most of the weight (12,000 to 25,000 lb., depending on the bit) used in drilling is supplied by the 150 ft. of drill collars on bottom. This minimizes the contact between the pipe and the walls of the hole.

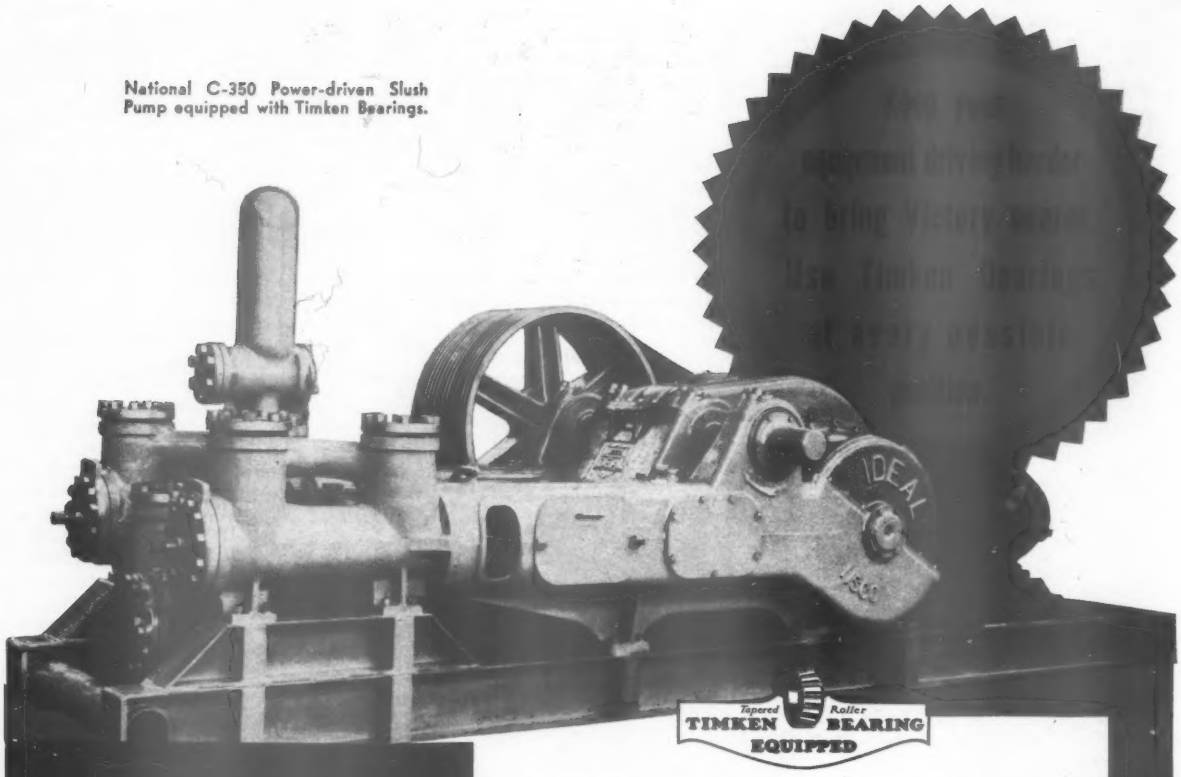
With the upper zones which might complicate the mud problem cased off there is still not complete freedom from mud troubles. Generally the hole stands up quite well with the exception of the interval from 3,800 to 4,700 ft. which is shale, and sandy and limy shale. There are some sands in this interval which flow salt or sulfur water and which cause the mud to have a high viscosity and water loss if not controlled. A mud weighing 9.6 lb. per gal. will hold the water in the formation and a further seal is obtained by using 20 to 25 sacks of Imperex plus quebracho and caustic soda while drilling this section. This gives a low-water-loss mud which plugs off the formation.

Mud is maintained at 9.6 to 9.8 and at a viscosity of 33 or 34 seconds A.P.I. until 8,800 ft. is reached. If the mud



Compact cooling arrangement for engine-jacket water on mechanical-electric rig. Steel tank contains coils over which water is sprayed. Fan creates forced draft whenever natural atmospheric cooling is not sufficient

National C-350 Power-driven Slush Pump equipped with Timken Bearings.



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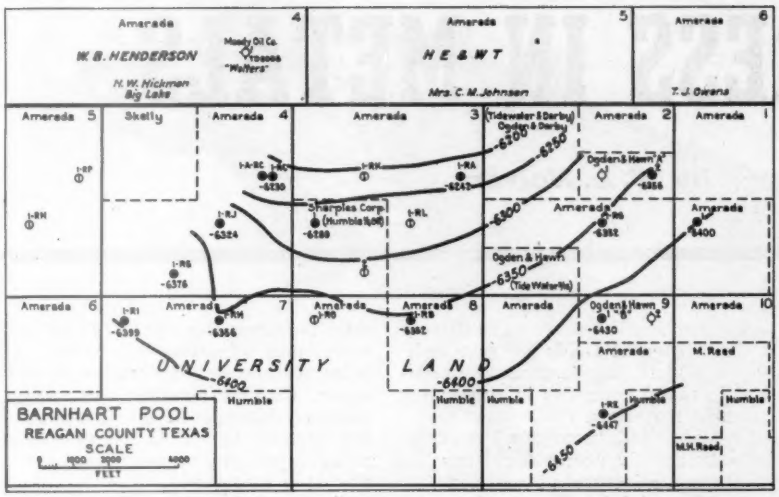
TIMKEN BEARING
EQUIPPED

Any kind of oil field equipment operates more efficiently when completely equipped with Timken Tapered Roller Bearings for it is not handicapped by friction; radial, thrust and combined loads; and misalignment of moving parts.

A few Timken Bearings are better than none; they will improve performance wherever installed. But in order for any machine to attain maximum speed, precision and endurance it must be equipped with Timken Bearings at every point of friction and hard service—as many makes of oil field machines already are.

Designing engineers who make full use of Timken Bearing advantages produce *better* machines and *better selling* machines because the trade-mark "TIMKEN" indicates "quality" to equipment buyers everywhere. The Timken Roller Bearing Company, Canton, Ohio.

"All There Is In Bearings"



Map of Barnhart pool in Reagan County, Texas, showing location of dry holes and abandoned locations. Subsea contours on top of Ellenburger. Interval 50 ft.

is not properly maintained, and if the pits are not kept clean and free from shale and cuttings, trouble with sticking pipe may be encountered. Keeping the water loss as low as possible helps and prevents the greenish-gray shale around 4,700 ft. from caving due to being wetted.

At 8,800 ft. the mud is prepared for drilling the pay section by removing as much of the solid materials as possible and then adding 3,000 lb. of Impermex, 1,200 lb. of caustic soda and 500 lb. of quebracho. This brings the water loss down to 2 to 4 cc. in 30 min, at 100 lb. pressure which prevents infiltration of water into the formation. The pay is then drilled and an electric log run to bottom after which the casing is run. The pay is quite soft and a substantial increase in the drilling rate is noted when it is encountered.

Two wells drilled in the field have used a different casing pattern, landing the intermediate string at just below 5,000 ft. These wells illustrate what could be done if it were not for the troublesome zone around 4,700 ft. One of these wells required 32 9⅞-in. bits to reach 5,016 ft. and 47 bits to drill the 4,230 ft. of 6¾-in. hole from there to 9,246, a total of 79 bits. The other well required 38 9⅞-in. bits and 45 6¾-in. bits to a total depth of 9,172 ft. Drilling fluid below the casing point was mostly water, and is the principal factor in reducing the number of bits required.

However, the 2,800 ft. additional of the 7⅝-in. casing is an expensive and at the present time a very important item. In addition the difference in the cost of 9⅞ and 6¾-in. bits is appreciable (approximately $33) which brings the bit savings down to an average of only $600 when setting the long intermediate string. This leaves the cost of all but $600 of the 2,800 ft. of pipe to be charged off against savings in drilling time. The experience on the two wells is cited merely to show how much bit consumption could be reduced if it were not for the necessity of maintaining a mud program designed to control the water-bearing sands.

Stuck Pipe

Every precaution is taken to prevent sticking of the drill stem but there have been a few cases although none of them caused the loss of the hole. While the field is not hard on drill pipe, there have been a few twistoffs and it has been found that if the fish is not caught immediately it will be stuck.

Also a cause for sticking near bottom was the deposition of a filter cake while circulating with a high-water-loss mud. Such cases of sticking occurred before use of the low-water-loss mud was started. Several things have been done to prevent sticking in addition to mud conditioning in such cases including keeping some weight on the bit and rotating fairly fast, setting down on bottom and rotating rapidly just before coming out of the hole after circulating, and exercising extreme caution when leaving bottom after circulating.

Away from bottom the most dangerous section for getting stuck is between 4,000 and 5,000 ft. In one case of pipe stuck at that point oil and water were tried without any effect. Attempts were made to work the pipe up and down as a matter of course but the effect gained by this method with 3½-in. pipe is not much. An attempt was made to cut the drill pipe just above the drill collars, the intention being to drive them to bottom, condition the hole and later fish out the drill collars. Inside cutters used failed to work and it was decided to twist the pipe off by rotating it. While this attempt was being made, the pipe began to rotate freely and was pulled from the hole.

From four to six drill collars or one or two drill collars plus four or five joints of 4½-in. flush-joint pipe are used on the bottom of the drill stems. No trouble has been experienced in keeping these drill-collar sections together. One drilling contractor uses a shock sub, which is simply a short section of drill pipe with a pin connection on either end for connecting the drill collars. Tapered drill collars are also used, i.e., the bottom one will be 5½ in. in diameter and the top one 5 in. in diameter.

Drilling Time

It takes from 70 to 80 days to drill a well in the Barnhart field. Six lines are strung in the blocks to start the wells and this changed to an 8-line reaving at about 7,500 ft. A 1⅛-in. drilling line will make about one well.

Derricks on 8-ft. substructures are used. All drilling rigs in the field are of conventional design and while modern have no revolutionary features. As the equipment is rather heavy, some advanced types of substructures are used under the drilling engines, compounds and draw works.

One of the rigs is a straight direct-current electric type with an individual electric motor direct connected to the rotary table. This rig has two 200-hp. motors driving the draw works through a twin reduction gear. The hoist in this case is four-speed. Two of the rigs at Barnhardt are powered with two six-cylinder diesel engines with one totaling 420 and the other 450 hp. Hoist on the 420-hp. rig has eight speeds and the other has six speeds. Another rig is powered by three 185-hp. diesel engines and has a four-speed hoist; this rig has the engines, compound and reversible clutch at ground level instead of on a substructure. Of the other two rigs, one is a diesel-electric rig with three internal-combustion engines driving three generators with the pumps and draw works driven by individual electric motors. The other is a part diesel electric and part mechanical rig. The pump is driven through V-belts by the engines which are also connected to generators supplying current to the electric motor driving the hoist.

One of the most convenient uses of equipment, and one not ordinarily seen, is the inclusion in the layout of several rigs of an extra pump of the 5 by 10-in. size driven by a 60-hp. diesel engine. This pump allows mud to be mixed or transferred without robbing the hole of any circulation or requiring a shutdown. It also can be used to maintain circulation while the regular pump is being repaired or in case of a complete failure on the regular pump it can be used for circulation until the pipe is brought out of the hole. Such arrangements often prevent serious jobs as a failure in the regular pump leaves the rig without any circulation unless a standby is available.

PROGRESS IN METALS

by W. L. Nelson

Metal-Working Terms

Threading and Tapping

Threading is a cutting operation by which various forms of a continuous spiral groove are cut on the external surface of a cylindrical object such as a shaft, screw cylinder, or circular plate. It may be accomplished by a single-tip tool or by a multiple-tip tool (a chaser) of the thread pattern desired, or it may be accomplished by means of a thread-milling cutter. Recently some threading is being done with thread-grinding machines. This operation results in a somewhat more smooth thread surface and more freedom from fatigue cracks or failure.

The threading of the internal surfaces of cylindrical holes is usually referred to as **tapping.** The same methods as those employed for external threading may be used but the common type of tool (tapping die) is a multiple-tip one whose profile resembles the thread pattern desired.

In the simple operation of threading by means of threading or tapping dies, the die rotates as it progresses over or into the material, the completed threads centering and guiding the die so that the first cutters of the die engage new material.

Cladding Methods Employed In Germany

The cladding of gross metals against corrosion is of particular interest to the petroleum and chemical industries, and at the moment may contribute to our war effort. The author is almost apologetic for stooping to a recognition of German methods or technicians, but upon consideration of the fact that our technical men are the equal of the Germans in most matters and are their superior in others, it was thought that we should take ideas from the Germans and develop them into useful operations. The following abstract was taken in part from the November 1942 issue of Metals & Alloys.

Abstract: Korrosion u. Metallschutz, Vol. 17, Feb. 1941, pp. 41-72.

Under the title Plattiertechnik (Mechanical Plating Technique) a whole issue of the above journal is devoted to the manufacture, properties and treatment of clad metals, several authors writing on the developments and surveying literature exhaustively in the different fields of this technique, which has become so important in many countries in conserving valuable materials.

The so-called "compound process" is today greatly perfected; it consists in the manufacture of cast-together materials or joining them under pressure and heat. The latter procedure is widely used in Germany, and permits the building of large tanks, vats and vessels in dimensions not possible before where nickel had to be used as material of construction.

The use of compound clad materials (nickel on steel, copper on steel) makes possible considerable saving in expensive materials. Very frequently, plating with non-rusting steels is used; the likelihood of the carbon of the base material diffusing into the cladding and forming chromium carbides in the grain boundaries can be prevented by using diffusion - preventing intermediary layers.

E. Schone discusses questions of quality in the production and use of plated sheets. He states in general that for plating by roll-welding those metals can be used that have a melting point higher than 1,400° F. irrespective of whether the cladding is done on one side only or both; in the latter case, cladding materials and thicknesses can be different on both sides according to the purpose.

Of great interest are testing methods for determining the bonding of the clad layer to the base material. Test results show that the adhesion increases with rolling temperature, naturally, and that even for copper on steel bond strengths about equal to the tensile strength of copper.

Such tests are now made in special setups, at as low as —275° F. and as high as 2,000° F. At these high temperatures, even quenching in water does not separate the plated layer from the base.

Bending fatigue tests at 10×10^6 load alternations and with loads of 20, sometimes even over 50 kg./mm.^{2} in the outermost region also did not show a separation.

Flame cutting, which is relatively difficult with copper, nickel and stainless steels, can readily be used for clad sheets by using the following precautions: Copper and nickel-clad sheets should be cut from the clad side, inclining the flame 10°-15° forward, and adjusting it so that the point of the cone just touches the clad layer. Cutting velocity and oxygen pressure depends on the thickness of the copper layer; in flame-cutting nickel layers the velocity can be considerably increased.

Sheets clad with rustless or acid-proof steels are best cut from the base-metal side, whereby the burner is inclined 12° opposite to the cutting direction; the starting point should be well preheated. Of the utmost importance is surface treatment, as defective surfaces give easy rise to corrosion. Proper cleanliness of the surface is best obtained by mechanical treatment, especially grinding.

Chemical properties of plated sheets and their welds are treated by W. Radeker. Only those metals assure a good bond with the steel base that are uniform in structure and pure; especially should they be free of oxygen and sulfur as these two elements prevent good metallic joints by forming separating layers.

Also heterogeneous constituents at the grain boundaries impair the cladding as they hinder the transmission of bond pressure to the base. Carbonyl nickel, additions of manganese to copper and nickel and of nickel to silver have improved the quality of the clad layers so much that they are now always employed.

In order to prevent harmful stresses in the (usually thinner) clad layer and between cladding and base the linear heat expansion coefficients should be as nearly equal as possible; the table shows coefficients of steel and its important cladding metals.

Material—	Temperature Range, °C.	Expansion coeff.	Conformance (steel—100)
Mild steel (0.15% C)	0-500	0.000014	100
Copper	0-500	.000018	130
Nickel	0-500	.000014	100
Cu-Ni stainless (18.8)	0-500	.000017	120
Cu-stainless (17%)	0-500	.000013	93
Monel metal	0-500	.000015	107
Silver	0-500	.0000195	140

Tests (by dissolving in acid) have shown, however, that these differences have no harmful effect on corrosion resistance. An investigation of the chemical resistance of welds on plated materials has shown in all cases that correctly made welds have

Easy There!

Uncle Sam: "Be careful when you're moving a boiler. You can damage the plates more when moving it, than by poor handling while under full steam. And remember — don't ever drop a boiler, not even a few inches!"

Operator: "Say! I thought you were the guy who needed so much oil! We've got to get this rig running; get the hole down. Haven't you heard there's a war on? This is no time to 'baby' a boiler!"

Uncle Sam: "That's right — don't baby it. Use it to help win this war. But use it wisely. Avoid strains and torsion when rigging supports with chains or when handling jacks."

Operator: "What do you mean, 'wisely'?"

Uncle Sam: "Just ordinary good practice. For instance, when in transit a boiler's supporting points should be about the same as at the battery. That way you won't strain the mid-section."

Operator: "You've overlooked something, Uncle. This is a Lucey Oil Country Boiler. Built to last for years and years."

Uncle Sam: "Yes, and it will last more years with proper care. Besides, boiler materials are mighty important to the Navy just now. The Lucey people are working for me, you know."

Operator: "Okay, Uncle. Whatever you say goes. You can count on us!"

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The entire facilities of the Electroweld Steel Corporation are now devoted to the war effort, however, when peace be ours, we would appreciate serving you with our high quality product.

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Manufacturers of pressure and mechanical steel tubing

the same resistance against chemical attack as the solid coating material.

In order to avoid formation of coarse grain in soft annealing, a cold-deformation of 25 per cent is recommended. The copper for cladding should be of more than 99.9 per cent purity, with 0.03-0.06 per cent P.

The special requirements for furnaces for heating the materials to be rolled together to welding heat and protecting them from oxidation are discussed at length by K. Scherzer. Electric resistance and also induction heating are used, the latter at normal voltages and frequencies for heating pressure vessels, whereby the walls of the vessels are heated.

The very interesting question of recovery of valuable metals from the scrap and waste in the manufacturing processes is discussed by W. Machu. As the thickness of the plated layer is between 3 and 60 per cent (in general, about 10 per cent) of the basic metal the saving is worthwhile. A review is made of the processes to recover the clad material and of relevant patents. Chemical and electrolytic methods are generally applied.

Data on Corrosion-Resisting And Heat-Resisting Steels

The new Tables of Data on Chemical Compositions, Physical and Mechanical Properties of Wrought Corrosion-Resisting and Heat-Resisting Chromium and Chromium-Nickel Steels published in December, 1942, by the American Society for Testing Materials have been under development for many months by Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys. Messrs. Franks and LaQue carried out the work for the committee, with data contributed by a number of manufacturers and users of stainless steel. An effort has been made to give the data in condensed form and to cover material in widest commercial usage. The first part pertains to wrought chromium steels, 4 to 6 per cent, 8 to 10 per cent chromium, etc., while the second part covers wrought chromium-nickel steels up to 25 per cent chromium, 20 per cent nickel. All told there are 21 extensive but compact tables and 26 charts and curves covering important data such as chemical composition, physical properties, forging and heat treating practices, and mechanical properties of steels. There is information on creep characteristics and short-time tensile properties. This latest publication is the third in the series on stainless steels issued through the work of the Society—the first two having been published in 1924 and 1930.

Copies of the 44-page pamphlet can be obtained from the A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia, Pa., at $1.25 per copy.

Waste in the oilfields can mean shortages on the battlefields . . . so conservation of equipment is one of your most vital wartime duties. Better equipment to start with is one way to conserve.

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The need for developing additional reserves is becoming more acute every day. To help you speed this important work and maintain peak production in existing fields, Westinghouse is ready with complete a-c and d-c electric drilling equipment.

Wires, not steam pipes nor lineshafting, carry the power where you need it. This means a reduction of setup time and added flexibility as to hookup or location. Compactness and mobility are important, too—skid-mounted generators, motors and control can be quickly hauled into position and wired up. Westinghouse Electric Rigs can go anywhere, on land or water, in trailers or barges.

Cost of setup goes down with Westinghouse Electric Rigs because there are fewer large, heavy units and no elaborate mechanical equipment to install. If high-line power is available, a-c rigs can be installed and power generating units eliminated, cutting costs still more.

For further important information, write for the new Electric Drilling Book. This book is just off the press. It contains 58 pages of illustrations, diagrams, lists of equipment required together with valuable maintenance information. Clip the attached coupon and mail today to Dept. 7-N, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

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Factors Affecting Expansion of Kansas Water-Flooding

by Paul Reed

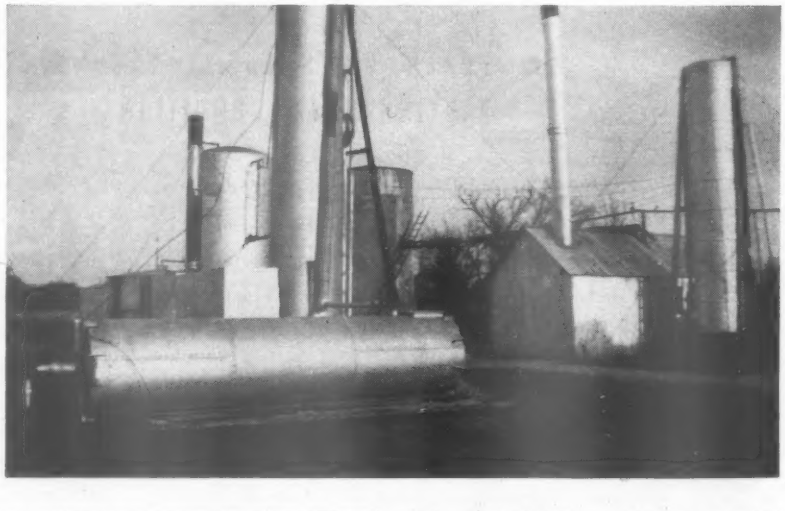
PLANS for operations of various kinds which depend on the future status of oil production in southeastern Kansas must take into consideration the continued expansion of water flooding in that territory. In the area in the vicinity of Chanute where water flooding has been carried on for six years, approximately half of the total production of about 2,000 bbl. daily comes from waterflood properties; the remainder from old stripper wells.

How long can production be expected to continue at its present rate? Will it be only a short time before the area will be flooded out and production will decline? In arriving at the answer that production may be expected to continue at its present rate or more for at least 10 to 15 years and possibly considerably longer, certain conclusions of engineers should be taken into account which apply to southeastern Kansas area as well as to other areas where water flooding can be successfully carried on at the present price of crude.

The essence of the water-flooding problem, as stated by Muskat,[1] lies in its economic rather than its physical aspects. For from a theoretical point of view the process of water flooding is an operation based on sound physical principles.

Instead of regarding water flooding as a practice to be adopted as a last resort, the industry is now changing its attitude, according to Fancher,[2] from one of suspicion and fear that irreparable damage to oil bearing strata will be done. Flooding is a possible solution of the major problem of the industry of producing oil profitably. In pursuing the subject further he directs attention to the fact that the price of crude oil in large measure affects the answer to problems connected with the relationship of oil content, permeability, porosity, grain size and other characteristics which are difficult to discuss in the abstract.

Operators have been attracted to southeastern Kansas because of the favorable sand characteristics of shallow formations containing oil of viscosities low enough for profitable recovery by water flooding. With an advance in price of crude, it may be anticipated that water flooding will not only be expanded in southeastern Kansas but it will probably spread to areas of deeper producing formations entailing higher development costs.



Left: Water-treating equipment: chemical mixers are housed at top of treating or reaction tank. Above: Equipment for breaking emulsions by heating and settling process

The present trend in southeastern Kansas is for water-flooding to supplant gas injection because of its greater effectiveness. In explaining the relatively low efficiency of gas injection, Muskat[1] observes that laboratory evidence leads to the conclusion that the total increased depletion of oil as a result of gas injection is at best only slightly greater than that which results from the natural primary recovery operations if

(Continued on Page 70)

Baash-Ross News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

OIL & GAS JOURNAL EDITION

Conservation Note to Owners of Baash-Ross Roller Kelly Bushings

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Your Baash-Ross Roller Kelly Bushing is one of the hardest working equipment-savers you have on your rig. It prolongs the life of your Rotary Table your Drill Pipe your Swivel your Drilling Bits and your Wire Line . Its maintenance is simple— reguler lubrication...and pays BIG returns in longer equipment life!

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USE A KELLY WIPER. We strongly recommend the use of a Kelly Wiper on our Roller Kelly Bushings. It helps to keep mud and water out of the bearings, thus prolonging their life and service. In addition, it helps you keep the rig floor free of slippery mud, saves wash water and reduces mud dilution. Wipers are available from either Baash-Ross or Patterson-Ballagh.

KEEP YOUR HEX BUSHING ADJUSTED. Baash-Ross engineers have incorporated a valuable performance feature into the Hex Roller Kelly Bushing . . . a simple method of quickly adjusting the Bushing for the close fit that is so important with modern Hex Kellys. First, determine in fractions of an inch how much play you want to take out of your Bushing. Then simply unscrew the lip ring, lift out the cages and remove one or more of the adjusting shims. The working diameter of the Bushing is reduced 1/32" for each shim removed, so it's easy to know how many to take out if you first determine the amount of play. After the shims are removed, replace the cages and tighten the lip ring. That's all there is to it!

REVERSE THE PINS. Another unique feature in Baash-Ross Roller Bushings is this. . . There is no driving pressure—therefore no wear—on the back side of the roller pins. If these pins have become worn on the front side, you can simply turn them so that the unworn back sides are to the front and you get new life from your pins. This cuts maintenance still further and insures peak performance *longer* without replacements!

We at Baash-Ross are vitally interested in seeing that you get ALL of the long life and smooth, efficient performance we build into every Baash-Ross Roller Kelly Bushing. If you have any questions on its maintenance or servicing, please feel free to write our engineering department any time. Your inquiry will receive prompt attention. *Or call the Baash-Ross service man near you!*

All lubrication fittings are centrally located, easy to reach!

WHEN you bought your Baash-Ross Roller Kelly Bushing, you not only bought smooth performance no other bushing can match—but *unusually long, trouble-free life*, as well. Typical is the Baash-Ross Roller Bushing that drilled more than 183,000 feet of hole before coming in for servicing . . . equivalent to more than *thirty-six* 5,000-foot wells without maintenance of any kind except lubrication!

That's the kind of long, trouble-free life built into these bushings, and the key to such performance can be summed up in two words . . . *proper lubrication.* To make greasing as simple as possible, ALL lubrication fittings are conveniently centralized on the top of the bushing where they're easy to reach. Each of these fittings (8 on the square-kelly bushing, 12 on the hex) controls an independent duct to each roller, insuring direct, *positive* lubrication to every bearing.

We've made lubrication easy and fool-proof. Now all you have to do is follow these rules...

▷ ***Pump grease into every nipple on the bushing each time you lubricate the draw-works —at least once each day. You can't over-lubricate the Bushing, so it's better to have too much than too little grease.***

▷ ***Use a water-proof grease. Such a grease will seal the bearings against the entry of water, mud and dirt . . . and gives much better protection than ordinary greases.***

Simply by keeping your bushing lubricated you'll keep it rolling smoothly for many thousands of feet of trouble-free service. For additional maintenance suggestions, see column at left.

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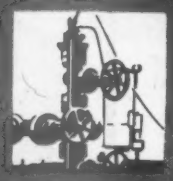
Parid P-51 may be poured into the tubing between the pump rod and the tubing walls by raising the stuffing box or Parid P-51 may be introduced in water dispersion without shutting down the well.



FOR FLOWING WELLS
The fluid level is dropped by shutting in the well, a pressure lubricator is connected with the tubing and the solvent is introduced into tubing under pressure.

FOR FLOW LINES
With the line as free of oil as possible, Parid P-51 is lubricated into the lead line at the well head. Gas from the casing is allowed to blow the Parid Solvent along the line, to get proper distribution. After standing for two hours or more, the line is flushed with oil.

Full particulars and instructions for the use of Parid are available in booklet form. Obtain a copy at your supply store.

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Reconditioning Used Equipment by Metal-Coating Worn Parts

by Charles K. Stipp *

Fig. 1—Rebuilding pump shafts by metallizing

Metallizing, or the process of metal-coating worn parts, has been used in many industries. It is particularly useful today when so many parts are almost irreplaceable. The process is ideally adaptable to rebuilding pump shafts, valve stems

SINCE there is still some controversy as to what actually occurs in the process of metal spraying, and because what happens contains the reasons for certain advantages which will be brought out later, it seems advisable to describe briefly the actual mechanics of producing a metallized coating.

By means of a compressed-air turbine which operates, through a speed-reducing unit, a set of feed rolls, the wire is fed continuously into a wire nozzle. The central opening through which the wire passes varies from 20 B&S gage to ⅛-in. diameter, according to the wire selected. Around the wire opening are small passages for the gas-oxygen mixture. In the type shown, there are six such openings arranged in a circle so that when the wire emerges from the front of the nozzle it almost immediately comes in contact with six small flames.

In examining the oxy-gas flame itself, it is discovered that there are two fairly well defined cones. The smaller one drives heat into the center of the wire. The larger cone, made up largely of hot gases, does the actual shearing off and atomizing of the molten metal. The air outside the nozzle merely drives these hot gases in toward the molten wire and does not come in direct contact with the particles until some time after they have left the metallizing unit.

Driven by the hot gases and later air, the tiny molten particles hit, with considerable force, the object to be coated.

The structure of the coating is shown quite clearly in the photomicrograph (Fig. 2) of sprayed copper, acid-etched and magnified.

It has been stated that the base material is at room temperature when

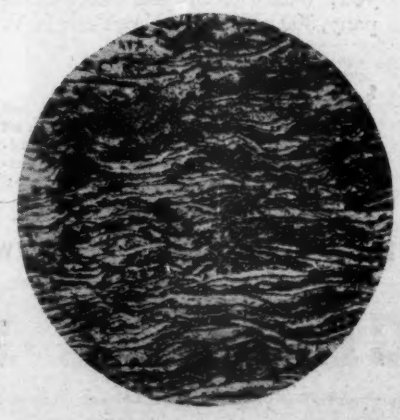

Fig. 2—Photomicrograph of a layer of metallized surface

*Metallizing Engineering Co., Inc. (Condensed from a paper presented before the Oklahoma group of the Society of Automotive Engineers at Tulsa.)

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the spraying begins. This means that there is very little, if any, fusion between the coating and the base. Instead, a preparation of the surface to be coated is essential.

Blasting was the first method to be developed and is still in general use. It does not, however, provide a particularly strong bond and should not be employed when machine preparation is possible. Of the three common abrasives, angular steel grit is the most practical. The best results are obtained by a mixture of No. 30 and No. 40, or No. 20 and No. 30. Using two sizes together produces a more irregular type of roughening. Metcolite, which is a nonmetallic grit, in size C — for coarse — works equally well. The third abrasive, sand, should never be used unless it is absolutely impossible to confine and recover the material.

Knurling with the ordinary tools should not be done. There is a special tool, however, a part of the Metco method, consisting of five circular blades with sawlike teeth, the blades assembled so that the teeth are staggered, which can be used when a strong bond is unnecessary.

Long ago it was determined that dovetailed threads would be desirable if they could be easily obtained. This has been accomplished. The Metco method first employs a square or slightly rounded tool.

After threading, the special tool previously described is run over the surface. The result is to roughen the ridges circumferentially and at the same time roll them over enough to cause considerable dovetailing in the spaces. By spraying at an angle of 45° each way, until these grooves or spaces are fairly well filled up, the effect is that of having shrunk a sleeve down into the surface of the shaft. Fig. 3 shows a surface ready for metallizing.

Finishing

The third step in any metal-spraying job is finishing. Wet grinding and dry grinding can be employed on any coating. Obviously, wet grinding is preferable where equipment is available, but dry grinding can be done instead. All sprayed metals tend to "load" a wheel. For that reason, a wheel of relatively coarse grain and low bond strength is necessary.

There is still much doubt on the ability of sprayed metal coatings to produce good machine finishes. It can be stated positively that the softer metals can be machined and will produce, with the proper tools, an excellent finish. These metals include the lower carbon steels, up to 0.25 carbon, and 18-8 type stainless. Some of the harder steels can be machined satisfactorily with carboloy tools.

Metallizing has certain and very great advantages. In the first place, due to the open grain or porous structure, a sprayed metal coating tends to absorb and hold oil, resulting in a reduction in operation friction of from 20 to 25 per cent. Its mechanical anchorage makes it possible to spray a coating of hard steel onto a shaft. Ordinary methods of hardening do not leave a surface which lubricates well. With metallizing then, it is possible to build up a soft steel with much harder metal, and one which at the same time will run with very much less friction.

Where metal is sprayed continuously onto a shaft which is revolving as rapidly as 50 surface feet per minute, a completely uniform build-up will result. To summarize advantages of metallizing coatings, they are:

1. Greater speed with resulting lower costs.
2. Greater versatility in selection of metals.
3. Absolute protection against stresses and distortion.
4. Uniform results.
5. Far better lubrication.

The Equipment

The air in metallizing performs two functions: first, feeding the wire into the gun, and second, (as was pointed out before), driving the hot gases in to shear off and atomize the molten end of the wire. For metal spraying alone, the compressor should be capable of delivering 35 to 40 cu. ft. of air a minute at 100 lb. pressure. Where blasting is to be done from the same air supply, the delivery must be from 75 to 100 cu. ft. a minute at 100 lb. pressure. Since the air must be very dry, it is occasionally necessary to install an air dryer.

The other fundamental equipment is the gun itself, air control, gas control, and hoses, and these will be taken up separately.

The air control unit performs a dual function in that it first filters the air, removing line condensation and any ordinary amounts of water, oil or dirt. The air then passes through the control valve where the pressure can be regulated as desired.

Regulators for the gas and oxygen should be of the two-stage type, and the low-pressure dials of both should be graduated to the pound. It is possible to use ordinary welding regulators for metallizing work and good results are obtained. However, the best work is accomplished where it is possible to have more accurate control than is necessary for most welding operations.

Last on the list is a means of holding and easily feeding the wire. The type usually supplied, consisting of a simple, ball-bearing supported reel with arms that are adjustable for different diameter coils, set on a stand of convenient height. A straightener which will remove coil curve and allow straight wire to feed into the gun will increase the spraying speed appreciably.

Most shaft work can and should be done in a lathe. As to the lathe itself, its main functions are to revolve the work and feed the gun along it. It is obvious that a lathe sufficiently accurate to permit the preparation and finishing, as well as the spraying, will eliminate double handling and setup.

Most shafts and wearing surfaces are worn irregularly. It has been

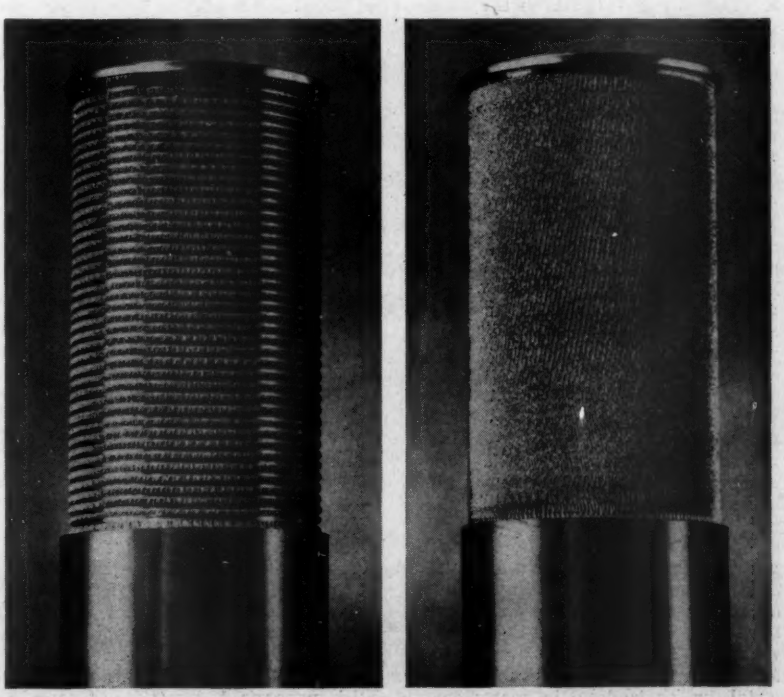

Fig. 3—Finishing shaft with Metco tool, prior to metallizing

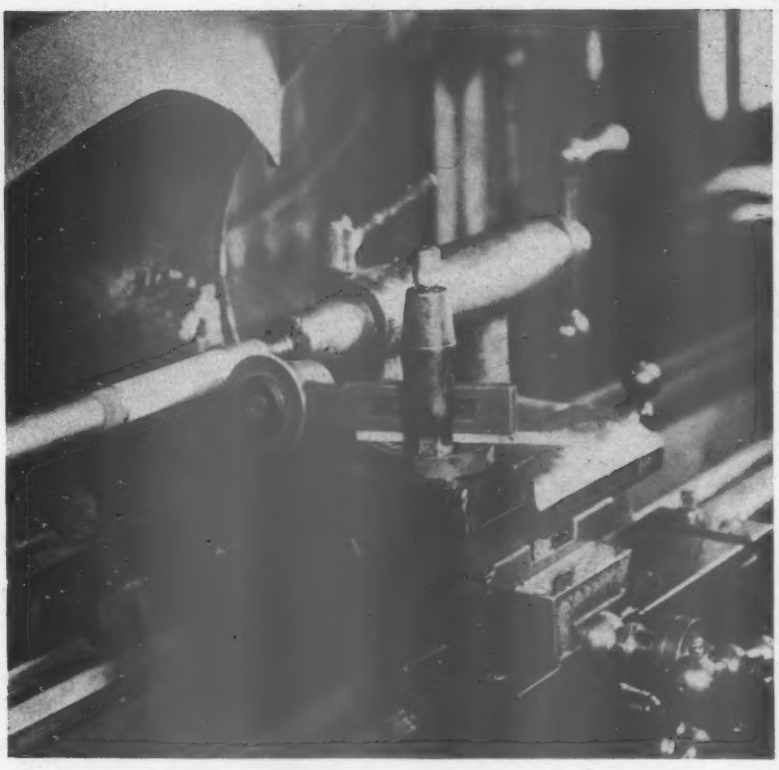

Fig. 4—Surfaces finished by two methods, ready for spraying

found desirable to take a cut across this surface so that an even thickness can be applied over the entire area. This undercutting should be deep enough to allow, on bearing surfaces, a minimum of 1/32 in. on the radius, plus a reasonable allowance for wear. Minimum thickness should be increased for shafts larger than 5 in. in diameter. On the subject of thickness, there have been instances where as much as 1 in. of steel has been sprayed onto the radius of certain large turbine shafts.

Purpose of Dovetailing

Second term is "dovetailing" of the ends of the worn section. Its purpose is twofold: first, to provide additional anchorage at the ends of the coating; and second, to provide a clean joint between the coating and the original shaft.

In the question of metal, it is possible to spray any metal which is available in wire form. Most of the work to be discussed will be steel, however, and there are eight or nine different kinds on the market. Selection from among these eight or nine steels should be made according to the characteristics which are desirable in the finished coating, and not according to the composition of the base material or the wire itself before spraying. Thus it is possible to apply a steel very similar to the base material, or, as is done in many cases, spray a steel which has greater hardness and better wearing qualities onto ordinary cold-rolled or low-carbon bases.

Acetylene is the most generally used gas, but the much lower cost of propane seemed, at first glance, to offer the possibility of considerable reduction in over-all expense. Exhaustive tests have shown that this first glance was misleading and that it is the cost of oxygen rather than the gas itself which finally determines which gas can be used most economically. Take the example of ⅛-in. diameter 0.10 carbon steel. Using 65 lb. air pressure, 15 lb. acetylene, and 17 oxygen, this wire can be sprayed with acetylene at 8 lb. per hour. Fifteen cu. ft. per hour of acetylene will be consumed at an approximate cost of 2½ cents per foot, making a total acetylene cost of 38 cents per hour. Using 30 lb. propane pressure, which is roughly equivalent to 15 lb. acetylene pressure, 14 cu. ft. of propane at 1 cent per foot will be burned per hour, or a total cost of 14 cents per hour, only one-third of the acetylene hourly rate.

But, when the oxygen cost is considered, the picture changes entirely. Average oxygen cost is about 1 cent per cubic foot. With acetylene, 43 cu. ft. per hour are needed, or a cost of 43 cents per hour. Adding this to the charge noted above, oxygen and acetylene together cost 81 cents per hour. With propane 104 cu. ft. of oxygen per hour will be drawn out of the cylinder. The total hourly cost then is $1.16 for oxypropane as against 81 cents for oxyacetylene. With propane at 30 lb., however, wire deposition increases to about 10 lb. per hour, so that the costs per pound sprayed are exactly equal, or 29 cents per pound. In other words, buy a gun which will spray either gas, and then take your choice as to cost.

One of the commonest shafts built up is a water-pump shaft. The shaft is set in the lathe, undercut, dovetailed, and rough-threaded. The remainder of the shaft is protected with masking tape, then blasted with No. 30 angular steel grit. At this point, it is ready for spraying. Stainless steel is built up on the prepared section to approximately 1/32 in. above the finished diameter, and finally machined or ground back to standard.

Brake Camshafts

Salvage of brake camshafts with worn bushing surfaces is another worthwhile procedure. A typical size is 1½ in. with 3-in. insert length. For maximum wear in this work, 0.80 carbon steel is used, and methods are the same as for water-pump shafts. Total salvage cost is $1.48 as against an average cost new of $11.40. Other companies report similar results.

Crankshaft restoration is very generally accepted as sound practice. The connecting-rod journals should be ground undersize a minimum of 0.100 in. on the diameter, being careful to preserve the radius of the original fillet. The surface is then blasted in the usual way and 0.80 carbon steel sprayed on. Allowance for finish is again about 1/32 in. on the diameter. When throws are metallized while the shaft is mounted on its own centers, and the gun, held by hand, follows the throw around, there is a tendency to produce an eccentric coating. Here a greater finish allowance becomes necessary, and the eccentricity is overcome by grinding on throw centers. One company reports that a crankshaft with all eight throws metallized, and several others with one or more, are giving excellent performance after well over 100,000 miles.

A metallizing unit can spray any metal that is available in wire form, and because of its mechanical bonding any of these metals may be built up on any base metal, similar or dissimilar. All of us are familiar with how difficult it is, under priority regulation, to obtain aluminum, copper, brass, and bronze. If, as may be the case, the situation on these metals becomes even more critical, doesn't this peculiar ability of metallizing present some rather radical solutions?

For example, there is a worn bushing made of bronze. A new one cannot be obtained, but the old one can be forced through a hole slightly smaller than its normal outside diameter, squeezed enough to allow it to be bored out to standard. The out-

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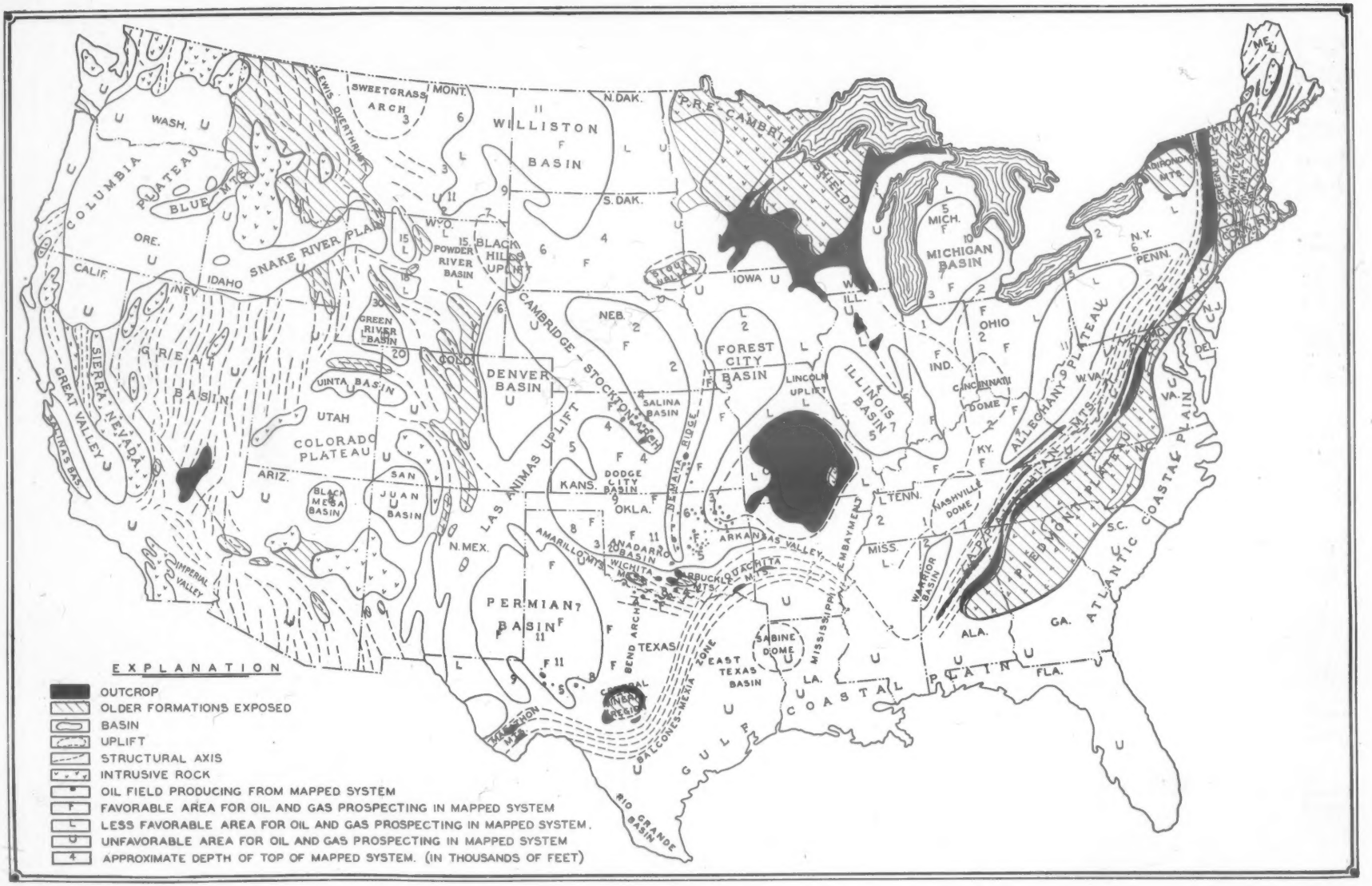
Cambrian and Lower Ordovician



OIL ZONES OF THE UNITED STATES

Cambrian and Lower Ordovician

(Compiled by The Oil and Gas Journal)

PRINCIPAL PRODUCING HORIZONS: The principal oil and gas pays in formations of Lower Ordovician and older ages are divisible into five groups:

Weathered pre-Cambrian rocks and basal sands and conglomerates.
Cambrian sandstone reservoirs.
Arbuckle and Ellenburger limestones.
Sandstones of the Simpson group and equivalents in Texas.
Dolomites of the Simpson group.

DISTRIBUTION OF PRODUCING AREAS: Wherever **pre-Cambrian** rocks are exposed to erosion, they may become porous. Fractures and joint planes become widened by the weathering processes and oil may be found in these fractured and porous zones. The pre-Cambrian rocks are, however, merely passive recipients of the oil which entered the openings after the weathered rocks were submerged. Thus the pre-Cambrian reservoirs of the Texas Panhandle are related to the Permian rocks which abut against the granite ridge and the oil is considered Permian in age. Areas of granite and granite wash, or residual soil on top of the granite which produce in places where the granite is overlain by Cambrian and/or Lower Ordovician rocks are found in western Kansas, southern Oklahoma and in Pecos County, Texas.

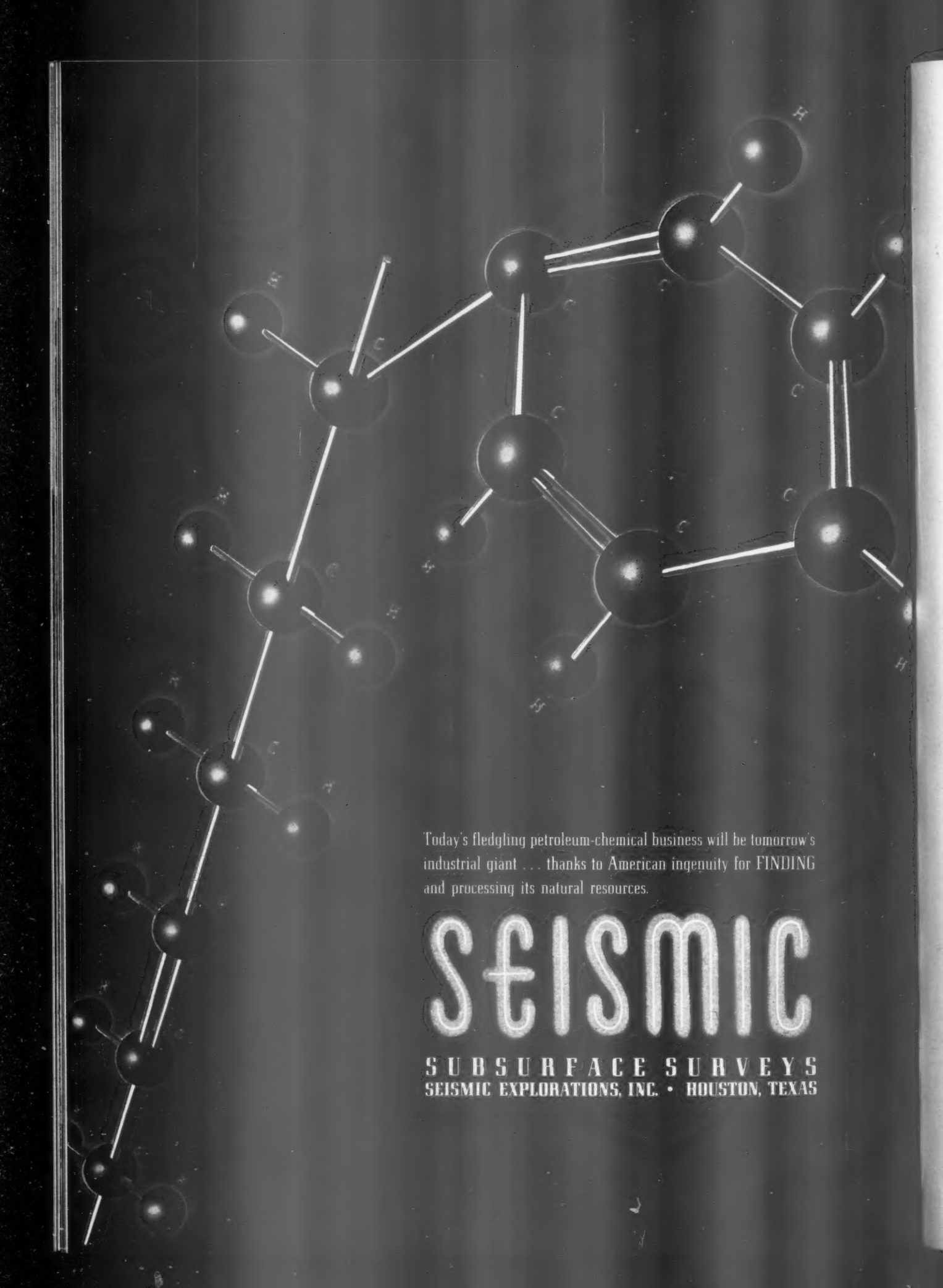
Cambrian sandstone production is relatively uncommon, being now found in Kansas, mainly in Russell County, and in Pecos County, Texas. The producing horizon is a sandstone which is generally closely related to other basal sandstones, but in places is a definitely bedded formation. The occurrence of oil in these sandstones where the Ordovician cover is either thin or absent leads to the possibility that more may be found where the Ordovician limestones are thicker. The probabilities are that where the Ellenburger and Arbuckle limestones are productive, prospecting for Cambrian oil will move towards the thicker limestone deposits gradually as, at present, the risk of not finding Cambrian oil does not warrant drilling through limestones which may range from a few hundred to thousands of feet in thickness.

The **Arbuckle limestone** is the most important producing horizon in western Kansas and the **Ellenburger limestone** is becoming increasingly important in North and West Texas. It may thus be considered a potential pay wherever it exists in a belt 600-700 miles wide extending to the northeast from West Texas. In addition to the large accumulations at Bemis, Trapp, Silica in Kansas, and the Sand Hills and other areas in West Texas, limestones of this age have produced large quantities of oil in fields along the Nemaha ridge, notably El Dorado, Kansas and Oklahoma City. East of the ridge, the Hittle pool, Cowley County, Kansas, obtains its major production from the Arbuckle lime. Porous zones are largely found in the upper part of these limestones where they were subjected to erosion prior to deposition of the overlying Simpson formations. However, the thick outcropping series in the Ozarks shows the presence of several unconformities and if these are found in the buried rocks, there may be a number of pays at depth in the limestone section. Some of these deeper pays have been found and these will probably lead to more exploration at depth in the limestones and through them into Cambrian and pre-Cambrian rocks.

The **Simpson group** consists of a number of sandstones and shales, generally containing green minerals. There is also some dolomitic limestone in the group generaly near the top. Sandstones of the Simpson group provide the most important pays in Oklahoma, notably in the Seminole district, along the Nemaha ridge and at scattered fields such as Cumberland, Pauls Valley and Apache. In Texas there is Simpson production in the Red River area and in the Abell field in Pecos County. This widespread occurrence of oil in the Simpson makes it a primary objective. At the present time, production of major importance is rarely found in older formations when it is found in the Simpson. This is probably due to the fact that when it is found in the Simpson it is not sought at greater depths. The Simpson pays include the **Wilcox, Bromide, Tulip Creek** and other sands. These names have been carried over extensive areas but definite correlations are doubtful.

Simpson dolomites produce in the Seminole and Oklahoma City areas but their output is unimportant compared with that of the Simpson sands.

EXTENSION INTO OTHER AREAS: In Illinois, the St. Peter was thought to be an excellent reservoir but to date has produced nothing. Farther east, sands of Chazyan age, roughly equivalent to the Simpson have shown some signs of production. North of the Ohio River, Lower Ordovician limestones are not highly considered but there is reason to believe that the Stones River, roughly equivalent to the Arbuckle, may prove productive in Kentucky and other states. Many consider, however, that these formations have been too highly altered to produce oil in the east. In the coastal area Cambrian-Lower Ordovician formations lie far beyond reach of the drill and are probably too highly altered to yield oil. In the Rocky Mountain area the Lower Ordovician is missing and the Deadwood sandstone (Cambrian) is not favorably regarded. West of the Rockies, rocks of this age are generally believed to be too highly fractured or folded to produce.



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In the matter of stainless shafts such as pumps, no one wants to build up worn packing sections with ordinary carbon steel, but it is certainly better than nothing.

To sum up this matter, the metallizing process does offer—through its pecularities, if you will—a solution to problems which cannot be solved in any other way now known. It holds the hope of reclamation of automotive parts even though the metals situation becomes blacker than anything we have seen yet. Some of the things being done with it and the possibilities suggested would not be recommended and would not be economically sound under normal conditions, but in this tremendous national emergency you can take advantage of every path open for the salvage and restoration of every possible worn automotive part.

A great deal of feverish development work has been going on for some time on a new method of surface preparation. It is entirely different from anything discussed previously here and it promises to revolutionize many metallizing applications and open up many more which have been impossible heretofore.

Fuse-Bond Method of Surface Preparation

This new method of preparing surfaces for metal spraying has been named "fuse bond." The method consists essentially of electrically fusing and bonding metal from an electrode on the surface to be prepared. This metal is bonded or welded to the surface and forms a metal froth or foam which presents a great number of holes and interlocks to which the sprayed metal may be bonded. The fusing is done electrically by connecting the electrodes to one lead and the work piece to the other lead of a source of electric current, and by contacting the work piece with the electrodes. While at first this appears to be quite similar to welding as it is normally practiced, actually it is quite different. The metal is deposited by actual contact of the electrodes with the work, and not by striking an arc. The contacting is normally done by a stroking or brushing motion of the electrodes, and it is usually best to use a multiple electrode holder, and about six electrodes. The heat for the melting and bonding of the electrode metal seems to be produced mostly by resistance heating rather than by arcing. Some arcing results, however, but the attempt is to keep the arcing at a minimum.

This method results in a lava-like deposit firmly bonded to the metal base. When looking at this deposit with a large magnification, the frozen foam structure may be readily seen and consists of large and small projections.

The metal spraying onto this surface is done by using standard spraying technique. As all sprayed metal shrinks somewhat upon application, there is always a tendency for the sprayed metal coating to shift or slide on the surface upon which it is applied. For this reason, a surface which might give a very good bond on a small area, when subjected to a large area test, may not be at all satisfactory for most spraying jobs. To give a good bond, a surface must have characteristics which prevent the shifting of the sprayed metal in shear or parallel to the sprayed surface. This is particularly true when spraying difficult jobs such as flat surfaces or where sprayed metal comes to the edge of a surface.

Grooving Methods

While grooving methods, when completely and properly done, are satisfactory they are usually expensive even on simple jobs such as on shafts and cannot be used, in many cases, due to the difficulty, or even impossibility, of this type of machining. The type of surface produced by the fuse-bond method has combined many of the advantages of both grooving and blasting methods. The small broken bubbles and frothy overhanging projections of the electrode metal form locks and crevices which are of the order of magnitude of the sprayed metal particles and hence interlock with them.

One great advantage of the fuse-bond method is that it is in no way limited by the hardness of the surface. Therefore, hardened surfaces can, for the first time, be sprayed with metal and a strong bond obtained, and no annealing of the surface is necessary. This one fact in itself, will, we believe, open up large new fields as there are so many parts, such as wrist pins, pinion shafts, etc., which cannot be metallized using any other methods of surface preparation.

The fuse-bond machine can be plugged into a power source of 110 or 220 volts. The machine contains a special transformer which controls the current at various voltages and conditions of varying electrode contact.

The speed of preparation varies considerably as in all preparation methods, in general is in the neighborhood of 2 to 4 sq. ft. per hour. This naturally depends upon the degree of bond required, as a more open surface comparable in strength with ordinary blasting, may be done in about one-third the time required for a surface which would give the best bond obtainable. During heavy use, power consumed is about 3 kva.

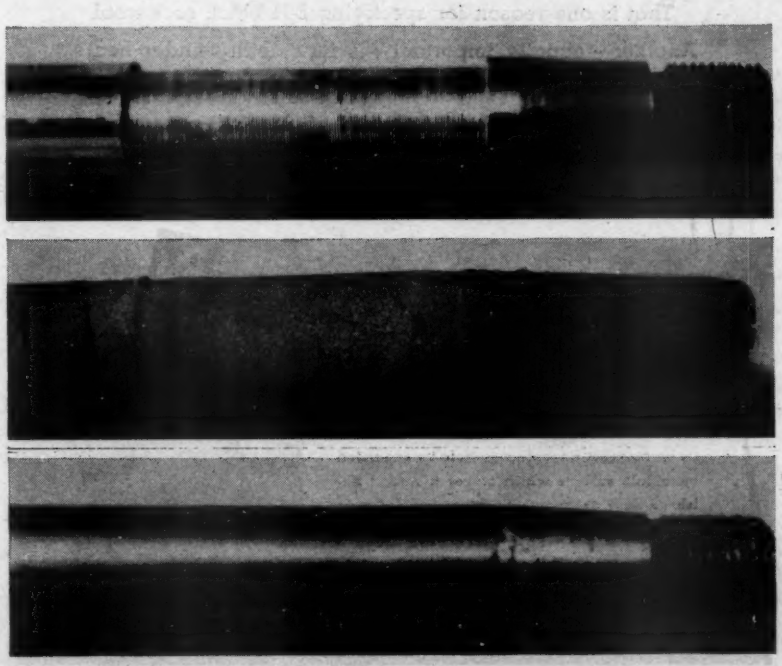

Fig. 5—Top: Pump shaft finished for spraying. Middle: Pump shaft rough finished, showing use of protective tape on parts not sprayed. Bottom: Rebuilt pump shaft, machined to size, and ready for service

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Kansas Water Flooding

(Continued from Page 62)

the latter were continued to the physical limits of pressure depletion. Hence the major economic contribution of the gas injection operation is derived from the fact that it makes available at commercially profitable rates of production that oil which cannot be obtained during the primary recovery stage at sufficiently high rates to warrant continued operation. Even though other phenomena in the field may make it possible to obtain total ultimate recoveries exceeding those corresponding to the extrapolation of the normal primary recovery curve, there seems little evidence that the gas injection process in depleted formations can approach of the efficiency of the water-flooding process.

Determining Policies

Given the essential conditions for profitable flooding such as a sufficient amount of residual oil in a sand, with desirable characteristics of uniformity and permeability, located where ample supplies of water are available, the operator must reach decisions regarding policies to be followed. More rapid recovery calls for higher development costs entailed in closer spacing of wells and heavier shooting. With this program may go higher water injection pressures and the practice of pumping rather than flowing producing wells. However, the comparative advantages of pumping and flowing continue to be debated. With a shorter period before the peak is reached, the larger oil production yields an income which returns the cost of the investment more rapidly; consequently interest charges are reduced. Such advantages must be weighed against desirable economies achieved by a slower policy.

Life of successful water-flood properties is said to be from 5 to 10 years. The first flood project in the Chanute area of any size was pumped in its early stages and is now being flowed with a daily production in its sixth year which is reported to be approximately the same as the original stripper production before flooding was undertaken.

In computing the annual percentage of total recovery obtained from intensive water-flooding operations in southeastern Kansas, Torrey[2] finds that in the sixth year production from a property amounts to 4 per cent of the cumulative total of production derived from water flooding. Within the first 2 years he estimates that production amounts to 55 per cent of the cumulative total; this is slightly higher than the 53 per cent recovery obtained in a like period of water flooding in the Bradford, Pa., field. However, his percentages are

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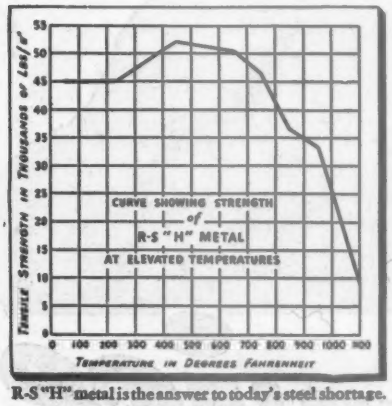

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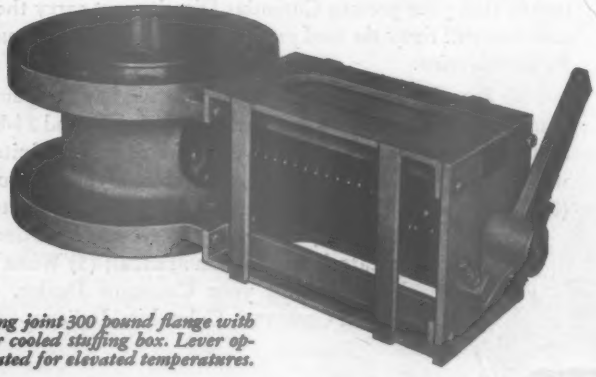

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derived from cumulative totals for Bradford at the end of 10 years of operation and for totals for southeastern Kansas at the end of 6 years.

The relation of water flooding to the remaining stripper production in eastern Kansas is indicated by figures obtained by Earlougher[4] in the fourth year of systematic water flooding in the area. These showed that 28.7 per cent of the total production of the area was the result of water flooding. This was water-flood production obtained from 3 per cent of the total acreage in the production area. Today water flooding in the Chanute area represents more than 7 per cent of the producing territory. Considering that this water flooding is the result of more than 5 years' activity, a conclusion might be reached that several decades would be required at the present rate of expansion to flood the entire district provided that economic conditions are favorable.

Prospects for Future

In making an effort to see as far ahead as 10 to 15 years, it appears highly probable that the spreading of water-flood operations will sustain the present rate of production for over such a period. In this article conclusions of students of the technique have been cited to indicate the close relationship of price of crude oil to other factors involved in profitable water flooding. A substantial advance in price of crude oil would justify modification of water-flooding policies so as to exploit the new possibilities for profitable operation which will be presented by the changed economic situation.

In appraising opportunities for profitable water flooding under changing conditions, operators and investors will be guided by results of core analysis interpreted in the light of experience in actual field operations in the area. In referring to the manner in which flood projects were planned and financed during the sharp rise of Bradford, Pa., operations from 1925 to 1937, Horner[5] calls attention to the general acceptance of core analysis measurements for forecasting ultimate yield of individual properties.

References

[1]Morris Muskat, "Theoretical Considerations Involved in Secondary-Recovery Operations" Secondary Recovery of Oil in the United States, American Petroleum Institute, 1942.

[2]George H. Fancher, "The Development and Operations of Secondary Recovery Water-Flooding Projects", ibid.

[3]Paul D. Torrey, "Economics of Secondary-Recovery Operations," ibid.

[4]R. C. Earlougher, "Water Flooding in Kansas," paper presented at spring meeting of Mid-Continent District, Division of Production, Amarillo, Tex., March 21-22, 1941.

[5]William L. Horner, "Controlling and Predetermining Secondary Recovery," Secondary Recovery of Oil in the United States, American Petroleum Institute, 1942.

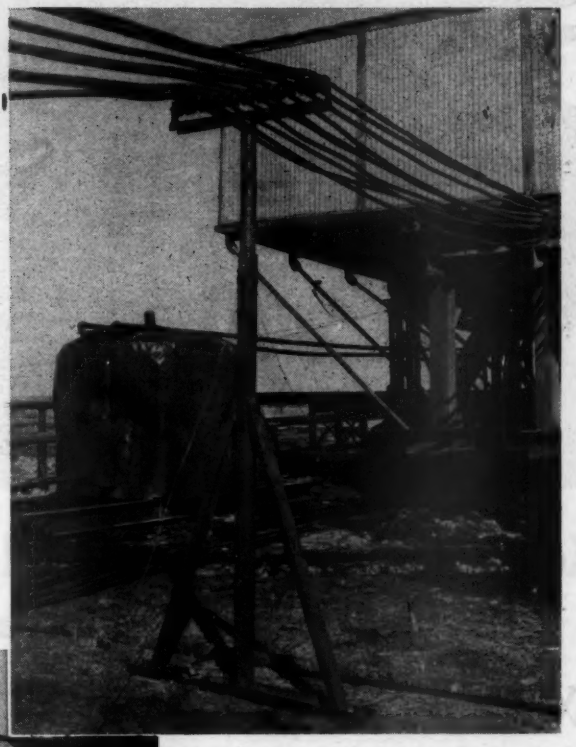
OPERATING IDEAS

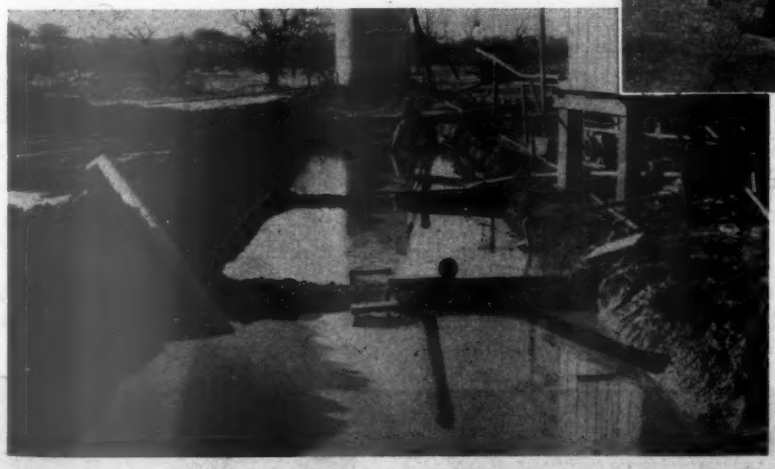
Steel Strap Protects Catline

TO keep the slack catline from becoming fouled or caught by the brake-cooling-water pipe and valve, a Gulf Coast contractor welds a vertical section of steel strap below the formed hood which protects the shaft end and water connection. This bracket, carried down to the steel plating forming the floor over the draw works skids, is bolted at that point and forms a continuous line or shield which fends the slack line away from the draw works and pipe connections, letting it fall clear to the floor and lie handy for quick handling when again needed. Besides keeping the derrick lines clear of the draw works, the guard also serves to protect the pipe carrying the cooling water from injury or damage by materials being dragged across the derrick floor.

Support for Overhead Lines

ONE drilling contractor operating a semielectric rig does not lay his cables on the ground or in a trough. Instead he uses adjustable pedestals supporting a row of insulator spools, one for each wire. The pedestal is made from 4-in. channel irons, 3-in. pipe and 2½-in. pipe. The spools are supported by a bolt which in turn is supported by a channel iron frame. The base prevents lateral sway while guy wires are employed to prevent movement in a direction parallel to the cables.





Earthen Partitions In Mud Pit

LUMBER is saved by one North Texas contractor by using dirt for the partitions in the mud pits. These dikes are built by the bulldozer which digs the pits just before completing them. Wooden troughs are then set in ditches dug through the dikes. The troughs are equipped with slots for gates to separate the pits while they are jetted and cleaned out.

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ALTERNATE CASING PROGRAMS

THERE are a number of ways of accomplishing any objective and all should be considered when outlining a program or a plan of action. Larger companies have traffic departments which deal exclusively with travel and shipping and which pick the most economical way of getting men and material from place to place. The same principle applies to the drilling of wells as there are in many instances several alternate procedures which could be followed.

Frequently what appears to be the most economical method may actually be the expensive one. There is also the danger of establishing a habit, custom, or plan of procedure which is no longer essential in view of changing techniques. What may have been necessary in the early days of development of a particular field may not be necessary several years or even several months later.

In the drilling of wells in most areas there are always a number of complicating factors. A few areas have simple drilling problems which are easily solved and the procedures to be followed are rather apparent. In most areas, however, one cannot meet a particular difficulty as he would like simply because it might aggravate another source of trouble. The program selected must be designed to meet all difficulties as well as possible under the circumstances. It may leave much to be desired, it may be reasonably expensive, but it may still be the best with the material and methods at hand.

One of the biggest advances in drilling since the discovery of oil has been the constant reduction in the amount of casing required to drill a well. And efforts are constantly being made to further reduce this item. However, the day is still rather distant when many deep wells can be equipped with a reasonably short string of surface casing and a small-diameter oil string.

An intermediate string of pipe serves numerous purposes. It may seal off gas-bearing, porous, water-bearing and other troublesome formations, not only during drilling but during the producing life of the field. For instance if there is a zone containing sulfide-bearing water which would give trouble during drilling, this same zone might cause failures in the pay string of casing later.

Again, the intermediate string reduces the number of complicating factors, one or several of which might be corrected easily but when all are considered together, the problem almost defies solution as conflicting treatments are required. For instance a high-pressure gas-bearing zone, a thief zone and a sloughing zone in one well will cause difficulties. A salt section, followed by any of these can often lead to trouble.

Selecting the exact point to run the intermediate string is extremely important and should be based on the combined knowledge of the drilling, engineering and geological departments. Every effort should be made to save as much casing as possible by setting the casing as high as conditions will permit. On the other hand, if an intermediate string of casing is to be run, it should be certain that it definitely controls the source of trouble. There is no greater waste than an intermediate string of pipe which fails to accomplish its objective.

Frequently there is a choice of intermediate casing points. At the upper possible point part of the trouble may be shut off by casing allowing the well to proceed without undue risk but still requiring considerable additional drilling expense. The lower casing point requires some risk in the upper portion of the hole and almost complete freedom from difficulties in the lower zones.

The selection of which point to use for casing must be based on a complete cost analysis including the cost of the casing, cost of bits, cost of mud and rig time under the two casing programs. Too often there is a temptation to base the judgment on only one of the above factors and pick a program because it shows a saving in one or two of the four factors.

For instance, the drilling may be in an area where the practice is to set an intermediate string after landing approximately 600 ft. of surface pipe. The depth of the wells is 10,000 ft. and a pay string of casing has to be run to that depth. There are troublesome zones at 2,500 ft. and at 6,200 ft. The upper zone affects the mud so it cannot be treated to drill safely below the 6,200-ft. zone. By casing off the 2,500 ft. zone, the mud can be safely and economically treated while drilling to 10,000 ft. If the hole is cased to below 6,200 ft., all complicating factors are removed and the lower hole can be drilled quickly and with low mud costs. The problem becomes one of picking the casing point which is the most economical.

Table 1 gives the individual cost for the various items and Table 2 gives a summary of the costs for the two programs.

TABLE 1

Cost of Various Items

	Size	No. bits	Cost each	Cost
Program 1	9⅞	50	$109.83	$5,491.50
	6¾	45	77.67	3,495.15
				$8,986.65
Program 2	9⅞	11	109.83	$1,208.13
	6¾	130	77.67	10,097.10
				$11,305.23

Casing

	Size	Grade	Weight/ft.	Feet	Cost/100 ft.	Cost
Program 1	7⅝	J-55*	26	6,200	$162.63	$10,083.06
	5½	N-80	17	10,000	106.48	10,648.00
						$20,731.06
Program 2	7⅝	J-55	26	2,500	156.22	$3,905.50
	5½	N-80	17	10,000	106.48	10,648.00
						$14,553.50

*L. T. & C.

TABLE 2

Summary of Costs

	Program 1	Program 2
Bits	$8,986.65	$11,305.23
Casing	20,731.06	14,553.50
Mud	750.00	1,400.00
Rig time at $350 day	22,750.00	24,500.00
Total	$53,217.71	$51,758.73

Both the money and steel advantages obtained favor Program 2 because the saving in casing costs more than compensates for the higher bit, mud and rig time costs. If 5 days more rig time were required for Program 2, the costs would be approximately equal. Risk factor, which is not included in the estimate, probably favors the shorter intermediate casing string as the reduction in number of bits in Program 1 over Program 2 is due to the use of a mud designed to make hole more than to protect it.

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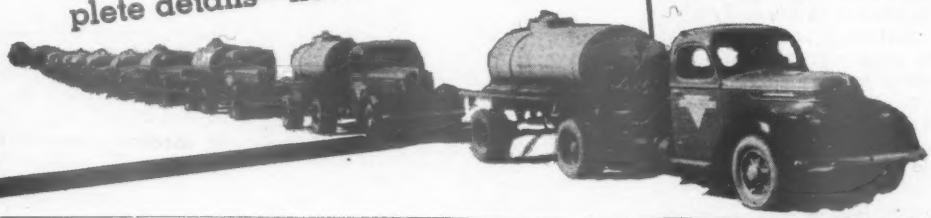

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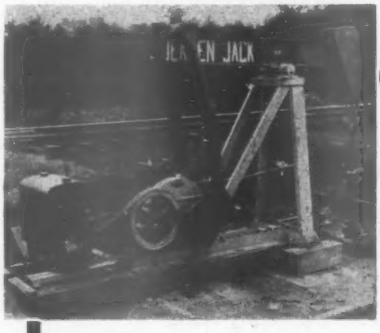

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WOODEN TANKS FOR SOUR CRUDE SAVE MONEY

ONE of the most serious problems facing those who handle fluids is that of corrosion. This is particularly true in the oil industry where frequently the crude-oil production is associated with considerable brine or the fluid, and the gas coming from it, may directly attack the material from which the storage vessel is made.

Most notorious are the hydrogen sulfide containing crude oils although ordinary oil-field brines are harmful to steel tanks. Sulfide containing crudes sometimes set up a corrosive condition in which the metal is oxidized and in other cases they attack the tank directly. Where the corrosion is due to the presence of air, the trouble can be eliminated by using a vaporproof system which excludes the oxygen. Where it is a case of direct chemical attack the only remedy is to cover the inside of the tank (bottom, sides and top) with an impervious coating which is insoluble in crude oil or to use a tank not susceptible to this chemical action.

Length of Life

In some cases the life of a steel tank is extremely short although tank makers in recent years have been able to lengthen their life by the proper selection of metals even in the worst areas. However, the steel tank used in corrosive areas eventually develops a number of leaks and weak spots and must be junked. Repairing it by welding is practically out of the question although a tank may be saved by coating the inside with an impervious material.

However, when it is known that the fluid being handled is corrosive, the selection and installation of wooden storage tanks may save considerable worry and trouble on the part of the operator. Even the sourest of crudes has little or no effect on a wooden tank after years of service. It is readily seen that a life of 20 years from a wooden tank as compared to 2 or 3 years from a steel tank gives the former a definite cost advantage.

Cost of wooden stock tanks commonly used on oil-producing leases is shown in an accompanying table. By comparing these prices with those published in a recent installment, it is seen that a 500-bbl. wooden tank with 2½-in. thick staves costs $1,283.80 set on a concrete foundation in West Texas whereas a bolted steel low 500-bbl. tank costs $988.30 plus the necessary charge for foundation grading. This is a little less than 30 per cent difference in cost.

Erection Costs

The erection costs for the wooden tanks are generally a little higher and the foundation costs are considerably higher than for steel tanks. However, the use of an adequate foundation for a wooden tank is essential if trouble from differential settling is to be avoided.

Wooden tanks can be had in any size desired as they are not cut to a pattern and shop fabricated, but they are built in place. The volume in barrels is only approximate, the exact volume of the tank being determined after it is built. Wooden tanks may also be purchased with sides, top and bottom of different thicknesses of wood although the prices in the accompanying table are for construction of the size material shown.

A wooden tank is more difficult to vaporproof and it is also more difficult to keep it from having either fluid or gas leaks. However, they are satisfactorily used in conjunction with vaporproof systems and proper care will prevent leaks. It is simply a matter of degree of maintenance requirements.

Protecting the contents of a wooden tank from the sun's rays and the consequent evaporation is also quite hard as it cannot be covered with a paint having a high reflective index. A good sun-deck and a water-cooled top help in reducing vaporization. Another objection to the wooden tank is that it is not as "streamlined" appearing as a steel tank.

The service and satisfaction obtained from a wooden tank will depend to a great extent on the care given it. Once set on a concrete foundation, it should be kept in operation if at all possible to do so. Naturally the tank has to be filled and emptied but a wooden tank should never be allowed to stand without fluid in it for any considerable period of time. If idle the wood will rot whereas if it is kept in service it will not. The tank should be checked occasionally to see if the hoops need tightening.

Surface Protection

A wooden tank should never be painted with a material which seals it from the air (pigmented, glossy and lacquer paints). A partially reflecting surface can be obtained by occasionally painting the tank with crude oil obtained from tank bottoms. This helps protect the wood in the tank.

In many areas it is common practice to use a wooden gun-barrel tank and steel stock tanks, the salt water, which is the cause of the corrosion, being removed in the wooden tank. In other cases gun barrel and stock tanks are all made from wood.

Choice between steel and wooden tanks depends on which will give the cheapest service under the particular conditions of service. If it will be necessary to replace steel tanks once during the life of the field, the use of wooden tanks with the additional investment and maintenance work should be seriously considered.

WOODEN STOCK TANKS

Size	Capacity	Price Wood Thickness 2-in.	2½-in.	3-in.	Cost of Moving Reset	Take down
16' by 8'	250	$537.65	$ 692.17	$ 740.75	$ 70.00	$30.00
16' by 10'	310	599.50	769.98	821.54	75.00	33.00
22' by 8'	500	836.53	1,065.03	1,146.33	110.00	37.50
22' by 10'	625	907.63	1,174.75	975.96	115.00	41.00

*Includes delivery and erection. West Texas price.

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Engineering Fundamentals No. 75

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

ISOTHERMAL COMPRESSION HORSEPOWER

EVEN though isothermal compression is never attained in practice, the work and horsepower required by the process are quite often used as ideal conditions with which the actual performance of a compressor may be compared.

The net work represented by an ideal P-V diagram as given in Fig. 2, Installment 73, is equal to the area enclosed in the diagram. This is true since the work done in compressing a gas is equal to the product of pressure and volume. If, in Fig. 2, Installment 73, the volume is considered in cubic feet and the pressure in pounds per square feet, the area, ABCD, of the diagram represents the net work in foot-pounds required to compress from the low pressure to the high pressure the volume of gas taken in (represented by line AB).

By integration, it can be shown that this area is equal to

$$W = 2.3\, P_1 V_1 \log_{10} R \qquad (1)$$

where

W = work required for isothermal compression, ft.-lb.

P_1 = intake pressure, lb. per. sq. ft., abs.

V_1 = volume of gas compressed measured at intake pressure, cu. ft.

R = ratio of discharge pressure to intake pressure = P_2/P_1.

Since, in compressor practice, gas volumes are ordinarily measured in standard cubic feet, equation (1) can be made into a more useful form by substituting P_sV_s for P_1V_1 and expressing the pressure at pounds per square inch. The most common standard conditions for gas measurement are 14.7 lb. per sq. in. abs. and 60° F. Then the equation for this set of standard conditions becomes

$$W = (144)\,(14.7)\,(V_s)\,(2.3)\,(\log_{10} R)$$

Combining all constants, the equation becomes

$$W = 4869\, V_s \log_{10} R \qquad (2)$$

where

W and R are defined as in equation (1) above

V_s = volume of gas compressed in cu. ft., measured at standard conditions of 14.7 lb. per sq. in., abs. and 60° F.

This equation can be used to calculate the work required to compress any volume of gas isothermally. Thus, if V_s in the formula is the standard volume of gas handled by the compressor in one cycle, equation (2) will give the work done per cycle in foot-pounds. If V_s is the standard volume compressed by the isothermal process in one day, the equation will give the total work done per day.

In order to calculate the horsepower required for compression it is necessary to consider the rate at which the work is done. As already discussed,* 1 hp. is being developed if work is done at the rate of 33,000 ft.-lb. per minute. Then

$$\text{Hp.} = \frac{4869\, V_s \log_{10} R}{33{,}000}$$

$$= 0.1475\, V_s \log_{10} R \qquad (3)$$

Where V_s = volume of gas compressed, standard cu. ft. per minute (standard conditions of 14.7 lb. per sq. in., abs. and 60° F.). The term R was defined in connection with equation (1).

A rather common practice is to express natural gas volumes in terms of M.c.f. (thousands of standard cubic feet) per 24 hours. If this unit of gas measurement is used, the equation becomes

$$\text{Hp.} = \frac{0.1475\, V_s \log_{10} R \times 1000}{24 \times 60}$$

$$= 0.1024\, V_s \log_{10} R \qquad (4)$$

Where V_s = volume of gas compressed, thousands of standard cubic feet per 24 hours.

*Installment 26.

Example 1

Problem: What is the isothermal horsepower required for compressing 1,000 standard cu. ft. of air per minute from an intake pressure of 14.0 lb. per sq. in., abs. to a discharge pressure of 60 lb. per sq. in.

Solution:

Using a table of logarithms:

$$R = \frac{60}{14.0} = 4.285$$

From a table of five-place logarithms,

$\text{Log}_{10} R = 0.63195$

Then,

$\text{Hp.} = 0.1475 \times (1000)\,(0.63195)$
$= 93.21$

Example 2

A compressor will handle 1,000,000 intake cu. ft. of gas per day. Based on isothermal conditions, what horsepower would be developed in the compressor cylinder when compressing the gas from 50 lb. per sq. in. gage to 250 lb. per sq. in. gage. Atmospheric pressure is 14.0 lb. per sq. in.

Solution: Using the perfect gas law* the standard volume of gas in M.c.f. per day is found to be

$$V_s = \frac{1{,}000{,}000}{1000} \times \frac{50 + 14}{14.7}$$

$$= 4528 \text{ M.c.f/day}$$

and,

$$R = \frac{250 + 14}{50 + 14} = 4.1$$

$$0.1024 \log_{10} R = 0.06275$$

Then, using equation (4),

$$\text{Hp.} = 0.06275 \times 4350$$

$$= 275$$

*Installment 10

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals No. 76

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

POLYTROPIC AND ADIABATIC COMPRESSION HORSEPOWER

IF the value of the exponent "n" used in Equation 3 of Installment 74 is known, the actual compressor cylinder horsepower required for the compression of a given quantity of gas in a given length of time can be calculated by methods that are to be described in this installment. This horsepower in the compressor cylinder should not be confused with the brake horsepower of compression. The brake horsepower of compression is somewhat larger than the compressor cylinder horsepower and represents the brake horsepower that an engine must deliver to a compressor not only to compress the gas but also to overcome the friction in the moving parts of the compressor.

Due to the similarity of the calculations involved, the determination of both polytropic and adiabatic horsepower will be discussed jointly in this installment.

Using integration and relationships established by the equation, $P_1V_1^n = P_2V_2^n = C$, the area enclosed by an ideal polytropic P-V diagram can be determined, and, as stated in connection with isothermal horsepower, will represent the work done in compressing the volume of gas taken into the compressor during the one cycle. The relationship so obtained is:

$$W = \frac{n}{n-1} P_1V_1 [R^{(n-1)/n} - 1] \quad (1)$$

where

W = work in ft.-lb.
n = exponent of compression.
P_1 = intake pressure, lb. per sq. ft.
V_1 = volume of gas compressed.
R = ratio of absolute discharge pressure to absolute intake pressure = P_2/P_1.

Naturally, if the volume, V, represents the volume of gas handled per cycle the equation will give the amount of work done in the cylinder per cycle, or if V_1, is the volume handled per minute the equation will give foot-pound of work done per minute, or if V_1 is the volume handled per day the equation gives the work done in foot-pound per day.

Since a common standard pressure for gas measurement is 14.7 lb. per sq. in. absolute, Equation 1 can be changed to a more convenient form by substituting this standard pressure in the equation, as follows:

$$W = \frac{n}{n-1} \times 144 \times 14.7 V_s [R^{(n-1)/n} - 1]$$

or,

$$W = 2{,}117 V_s \frac{n}{n-1} [R^{(n-1)/n} - 1] \quad (2)$$

Where V_s is the volume of gas handled measured at 14.7 lb. per sq. in. and all other terms are as defined in connection with Equation 1.

When V_s is in terms of cubic feet per minute, the horsepower required for compression is:

$$Hp. = \frac{2{,}117}{33{,}000} V_s \frac{n}{n-1} [R^{(n-1)/n} - 1]$$

or,

$$Hp. = 0.0642 V_s \frac{n}{n-1} [R^{(n-1)/n} - 1] \quad (3)$$

If V_s is expressed in terms of thousands of standard cubic feet per 24 hours the equation becomes:

$$Hp. = \frac{2{,}117 \times 1{,}000}{24 \times 60 \times 33{,}000} V_s \frac{n}{n-1} [R^{(n-1)/n} - 1]$$

or,

$$Hp. = 0.0445 V_s \frac{n}{n-1} [R^{(n-1)/n} - 1] \quad (4)$$

In Equations 1, 2, 3 and 4, if the value n is replaced by the ratio of the specific heats, k, or C_p/C_v, the equations hold true for adiabatic conditions. Since no compressor ever operates under adiabatic conditions, however, such a substitution is seldom required in working with practical problems.

Values of $[R^{(n-1)/n} - 1]$ corresponding to various values of R and n are given in Table 1 and are convenient in making calculations involving any of the equations given above.

TABLE 1—Values of the Factor $[R^{(n-1)/n} - 1]$ for Use in Calculating Work and Horsepower of Compression

Pressure ratio, R	Value of exponent, n								
	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50
1.3	0.0125	0.0241	0.0348	0.0447	0.0539	0.0625	0.0704	0.0778	0.0849	0.0913
1.4	.0163	.0310	.0449	.0578	.0697	.0810	.0914	.1010	.1100	.1185
1.5	.0195	.0375	.0544	.0700	.0845	.0982	.1110	.1228	.1343	.1447
1.6	.0226	.0436	0.631	.0814	.0985	.1145	.1297	.1435	.1572	.1694
1.7	.0256	.0494	.0716	.0926	.1140	.1304	.1474	.1635	.1790	.1933
1.8	.0284	.0549	.0797	.1030	.1246	.1453	.1645	.1824	.2000	.2162
1.9	.0310	.0601	.0873	.1128	.1370	.1598	.1810	.2010	.2205	.2380
2.0	.0338	.0650	.0947	.1224	.1487	.1738	.1970	.2185	.2405	.2600
2.1	.0360	.0698	.1014	.1318	.1600	.1870	.2120	.2360	.2595	.2805
2.2	.0382	.0743	.1083	.1404	.1710	.1997	.2266	.2520	.2775	.3000
2.3	.0404	.0786	.1147	.1490	.1824	.2120	.2410	.2680	.2950	.3200
2.4	.0426	.0828	.1220	.1570	.1915	.2240	.2545	.2840	.3125	.3390
2.5	.0446	.0868	.1270	.1650	.2010	.2365	.2680	.2985	.3290	.0365
2.6	.0466	.0908	.1328	.1725	.2106	.2470	.2815	.3135	.3455	.3755
2.7	.0484	.0945	.1384	.1800	.2200	.2580	.2935	.3280	.3615	.3920
2.8	.0503	.0981	.1438	.1870	.2285	.2685	.3060	.3415	.3775	.4100
2.9	.0520	.1017	.1490	.1945	.2375	.2790	.3182	.3555	.3920	.4260
3.0	.0537	.1050	.1540	.2005	.2460	.2890	.3300	.3685	.4070	.4420
3.1	.0554	.1083	.1591	.2075	.2543	.2990	.3410	.3810	.4210	.4580
3.2	.0570	.1113	.1640	.2140	.2620	.3085	.3520	.3940	.4355	.4730
3.3	.0585	.1145	.1687	.2203	.2695	.3175	.3625	.4060	.4490	.4885
3.4	.0600	.1175	.1730	.2260	.2775	.3270	.3735	.4180	.4630	.5040
3.5	.0615	.1205	.1777	.2320	.2850	.3360	.3840	.4300	.4760	.5180
3.6	.0629	.1233	.1820	.2380	.2920	.3440	.3940	.4410	.4890	.5320
3.7	.0642	.1263	.1860	.2435	.2990	.3530	.4040	.4520	.5010	.5450
3.8	.0656	.1290	.1902	.2495	.3060	.3620	.4140	.4640	.5140	.5600
3.9	.0670	.1317	.1942	.2545	.3125	.3695	.4240	.4750	.5260	.5740
4.0	.0683	.1344	.1980	.2600	.3190	.3775	.4320	.4860	.5380	.5860
4.1	.0696	.1368	.2020	.2650	.3265	.3855	.4410	.4960	.5500	.6000
4.2	.0707	.1393	.2058	.2705	.3325	.3930	.4510	.5060	.5620	.6130
4.3	.0719	.1417	.2095	.2750	.3385	.4000	.4600	.5160	.5730	.6250
4.4	.0731	.1440	.2135	.2800	.3450	.4080	.4680	.5260	.5840	.6380
4.5	.0743	.1464	.2165	.2850	.3510	.4160	.4760	.5360	.5950	.6500
4.6	.0753	.1490	.2200	.2890	.3565	.4220	.4850	.5460	.6060	.6620
4.7	.0765	.1509	.2240	.2945	.3630	.4300	.4940	.5560	.6170	.6740
4.8	.0776	.1532	.2275	.2990	.3690	.4370	.5020	.5650	.6280	.6860
4.9	.0786	.1554	.2305	.3035	.3745	.4430	.5100	.5740	.6380	.6980
5.0	.0796	.1577	.2335	.3080	.3800	.4500	.5180	.5840	.6480	.7090
5.5	.0845	.1676	.2490	.3285	.4060	.4820	.5560	.6260	.6990	.7650
6.0	.0890	.1770	.2635	.3480	.4310	.5130	.5910	.6680	.7440	.8170
6.5	.0932	.1855	.2765	.3660	.4540	.5410	.6240	.7070	.7880	.8650
7.0	.0971	.1933	.2890	.3830	.4760	.5670	.6560	.7420	.8300	.9120
7.5	.1007	.2010	.3005	.3995	.4960	.5930	.6860	.7770	.8690	.9570
8.0	.1041	.2080	.3115	.4140	.5160	.6160	.7140	.8110	.9070	1.0000
8.5	.1072	.2145	.3220	.4290	.5340	.6390	.7410	.8420	.9420	1.0400
9.0	.1102	.2210	.3320	.4420	.5520	.6610	.7670	.8720	.9750	1.0790
9.5	.1131	.2270	.3415	.4560	.5690	.6820	.7930	.9020	1.0120	1.1170
10.0	.1158	.2327	.3500	.4680	.5840	.7020	.8160	.9300	1.0430	1.1530

Natural Gasoline

Lone Star Builds Central Fractionation Plant

DALLAS, Tex.—Construction work is approximately 60 per cent complete on a central fractionating plant at Ranger, Tex., which will process the raw gasoline produced in the several West Central Texas district plants operated by the Lone Star Gas Co. and Lone Star Producing Co. The central plant, when completed, will be capable of producing propane, isobutane, normal butane, isopentane, normal pentane and heavier hydrocarbons.

Establishment of central plants for closer fractionation of the raw material produced in conventional natural-gasoline plants has been recommended by leaders in the industry as one method of converting facilities to manufacture of war materials. There are numerous natural-gasoline plants in various sections of the country which recover only an unstabilized product, meaning that the butanes, propanes and pentanes are either consumed in ordinary motor fuel or turned over to refiners for recovery. In many instances these less modern plants are so situated that central-fractionation projects could be adapted.

A 25-mile 4½-in. gasoline line from Ranger to Brooks Plant in Breckenridge has been completed.

Practically all of the pumps, engines and other equipment used in the plant were salvaged from second-hand materials. Two giant towers, 112 ft. by 7 and 4 ft. respectively, have been erected. The former is a deisopentanizer and the latter a deisobutanizer.

The plant will be under the direction of J. R. Jarvis, superintendent, and Harry Wheeldon, assistant, both of Dallas, and John Kindle, of Ranger.

Desulfurizing Unit Added At Sunray's Allen Plant

Sunray Oil Corp. has completed a Girbotol desulfurizing unit and has extended its polymer unit at the refinery at Allen, Pontotoc County, Oklahoma, C. H. Wright, president, reported to stockholders at Tulsa last week. This new equipment permits the company to produce codimer, used in the manufacture of 100-octane gasoline. These installations also necessitated construction of a new pipe-line system to handle different types of crude, he added.

Wright estimated the company had increased its crude-oil reserves by 2,000,000 bbl. during the 1942 period by purchase of 21 per cent of the corporate stocks of the Alma Oil Co.

Construction Progresses On New Illinois Plant

SALEM, Ill.—Construction work is progressing on Sunflower Petroleum Products Corp.'s natural-gasoline plant at Benton, Ill., which will have facilities for production of 50,000 gal. of gasoline per day. The plant also will include facilities for production of 25,000 gal. per day of liquefied petroleum gas.

Drip Still Completed at Pure's Oilton, Okla., Plant

A new drip gasoline still is now in operation at Pure Oil Co.'s Oilton, Okla., plant. The unit lacks only the insulation before the project can be called a completed job.

The company also has completed replacement of the section of the vacuum line from the plant to the Jennetta Richard plant and work is progressing on replacement of the high-pressure coils in the Oilton plant's No. 2 unit.

Natural Gas

Consumption Holding at 10 Per Cent Higher Rate

NEW YORK.—The increase of more than 10 per cent in consumption of natural gas, as reflected by sales of utility companies reporting to the American Gas Association, continued through last November, according to monthly statistical figures released here last week.

November sales of natural gas totaled 159,473,700,000 cu. ft., an increase of 11.3 per cent over distribution for the same month a year earlier. Consumption for the first 11 months of last year totaled 1,589,475,700,000 cu. ft., an increase of 10.3 per cent.

Industrial sales during November totaled 81,644,400,000 cu. ft., up 9.6 per cent while consumption in generation of electricity rose to 20,364,300,000 cu. ft., a gain of 23.2 per cent over the demand in this classification in November 1941. Domestic sales continued their moderate increase, being 7.4 per cent above 1941 consumption at 39,720,600,000 cu. ft. for the month and 13 per cent higher for the 11-month record.

17 Students Made Fellows In Gas-Research Projects

Seventeen students from 14 colleges have been selected out of 150 candidates to receive this year's fellowships in gas research at the Institute of Gas Technology, Chicago, Ill. This increase above the 15 awards which are normally provided was made because of the expectation that some might be withdrawn because of military or other service during the year.

These students each receive a stipend of $1,135 per annum to cover expenses, Harold Vagtborg, director of Illinois Institute of Technology, announced. The Gas Institute is affiliated with the Illinois Tech. Ten of these students ranked first in their college graduating classes; 49 memberships in honorary scholastic and professional organizations are held by the group, including two Phi Beta Kappa and two Sigma Xi. During the summer these students will be employed in the gas industry by individual companies at current salaries. The course of study of these students will fit them for key positions in the natural and manufactured-gas industries in fundamental and applied research, in plant operations and in administrative positions.

Houston Gulf Seeks Permit to Borrow

Houston Gulf Gas Co. of Louisiana (affiliated with United Gas Pipe Line Co.) has asked the Securities and Exchange Commission to permit it to issue a $600,000 promissory note to enable it to complete the sale of certain pipe-line facilities.

The money is to be used to construct new facilities and effect changes in Houston's existing structure before conveying to Defense Plant Corp. its natural-gas line from Refugio to Pierce Junction, Tex., for conversion into an oil line.

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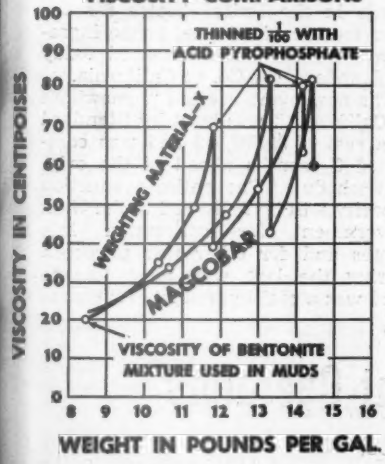
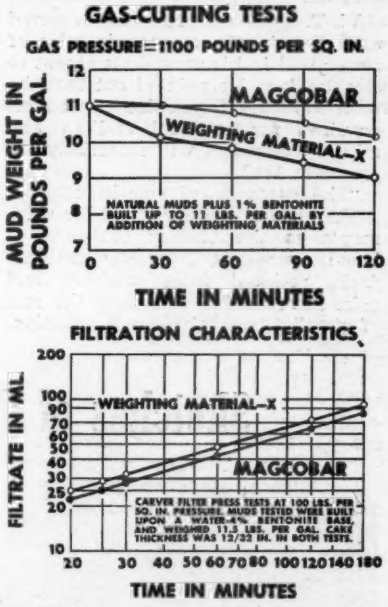
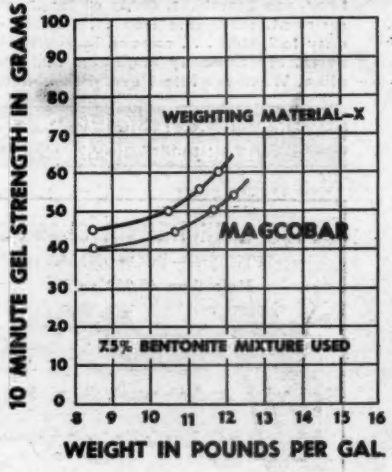


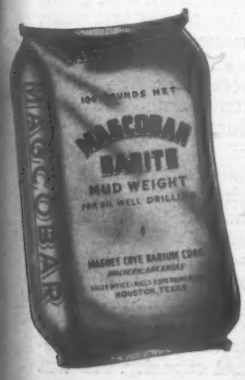
GAS-CUTTING TESTS



FILTRATION CHARACTERISTICS

GEL STRENGTH COMPARISONS





WAREHOUSE STOCK POINTS

Texas—Alice, Alvin, Bay City, Beaumont, Houston, Katy, Pinehurst, Refugio and San Benito. *Louisiana*—Baton Rouge, Berwick, Harvey, Houma, Jennings, Ferriday, Lockport, New Iberia, Opelousas, Sulphur, Venice and Ville Platte.

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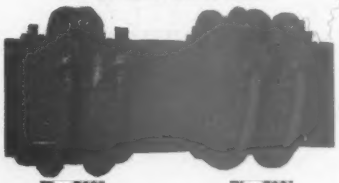

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REFINING

Ohio Standard's Aviation Fuel Sales Rise 484 Per Cent

CLEVELAND, Ohio. — An increase of 483.9 per cent in the volume of aviation gasoline sold during 1942 by the Standard Oil Co. of Ohio, coupled with volumetric gains ranging from 11.4 to 78.4 per cent in the manufacture of other war products were reported last week by the Standard Oil Co. of Ohio. Higher requirements for products related to prosecution of the war, manufacture of war products and for coping with East Coast fuel shortages combined to lift Standard of Ohio's sales last year 8 per cent above 1941 operations.

W. T. Holliday, president, reported a decline in the company's sales of motor fuel in his annual statement to stockholders. He pointed out that the total volume of petroleum products required for essential civilian and military purposes will materially increase in 1943.

"The demands of war industries," declared Mr. Holliday, "and for shipments to the eastern seaboard of heavier products, especially distillate fuels, residual fuels, asphalts and coke have tended to reduce the role of gasoline as petroleum's principal product. The wartime demand upon the company's refineries for nongasoline products is shown by the following percentage increases in volume of sales of some of the products other than motor gasoline in 1942, as compared with 1941:

Product—	Per cent increase
Aviation gasoline	483.9
Kerosene	42.6
Industrial lubricating oils	78.4
Light burning oils	78.4
Industrial fuel oils	11.4

Standard of California Completes Toluene Plant

Completion of one of the largest plants in the United States for the manufacture of toluene, prime ingredient of TNT, was announced today by Standard Oil Co. of California.

The new plant, erected "somewhere in California," was built by Standard at a cost of $9,500,000 and was completed 3 months ahead of the original schedule. The entire production capacity will be delivered to the U. S. Government for conversion into bombs and for other war purposes. During the last war most toluene used was a coal byproduct. Its cost to

Sketches of Plant Operators

W. B. STEWART

W. B. STEWART, assistant to the vice president in charge of manufacturing since October of last year, has been made manager of products manufacture for Shell Oil Co., Inc., in New York, succeeding Age Skiolvig, who has been granted leave to serve as a lieutenant commander in the Navy.

Mr. Stewart has been with Shell since 1926 when he went to work as a technical assistant at the Wilmington, Calif., refinery. Two years later he was made head stillman. The next 5 years were spent at the Dominguez, Calif., and Wood River, Ill., refineries and in 1933 he went to the manufacturing department in San Francisco in a technical capacity. He was appointed assistant to the refinery manager in 1935 and served a year each at Martinez and Dominguez.

From 1938 to October 1942 he held refining posts with affiliated companies before being appointed assistant to the vice president.

the Government was several times the present cost, according to R. G. Follis, Standard Oil's vice president in charge of manufacturing. Drastic reduction in cost, Mr. Follis said, is due to new catalytic processes for the synthetic production of toluene from petroleum, as developed by the laboratories of Standard and other companies. Since the processing operation for the manufacture of toluene requires several weeks' time, first deliveries from the new plant will not be made until some time next month.

W.P.R.A. Annual Meeting At Kansas City March 25

The thirty-first annual meeting of the Western Petroleum Refiners Association will be a 1-day session, in the Hotel Muehlbach, Kansas City, Mo., Thursday, March 25, John C. Day, executive secretary of the association, announced today. It will be a business meeting correlating the numerous emergency and other activities of the association and its members.

The principal speakers for this meeting are:

Bruce K. Brown, assistant deputy petroleum administrator; Robert K. Minckler, director of the Petrolum Supply Division, PAW, and F. B. Dow, counsel for W.P.R.A. in Washington, and in charge of petroleum transportation for the Office of Defense Transportation.

PAW Lifts Limitation on Eastern Farm Gasoline

WASHINGTON, D. C.—Lifting of the limitation on the amount of gasoline withdrawn from primary storage each month for agricultural use in the 17 eastern states was announced March 12 by Petroleum Administrator Harold L. Ickes.

The action was taken, the administrator explained, as a means of assuring a free flow of gasoline for agricultural use to the extent permitted by over-all supply.

"Last December, in order to prevent dangerous drains upon our limited stocks of petroleum in the East, it was necessary for the Petroleum Administration to control the amounts of these products which were to be withdrawn from refineries at terminal supply points.

"It is now evident, however, that these controls may act to limit the supply of retailers to the extent that they may have difficulty in meeting the requirements of their farm customers for spring plowing and planting. This must not happen.

"The Petroleum Administration recognizes that the farmer has a preferred claim on petroleum products."

What's Going On At the Plants

Franco Oils Studying Processes

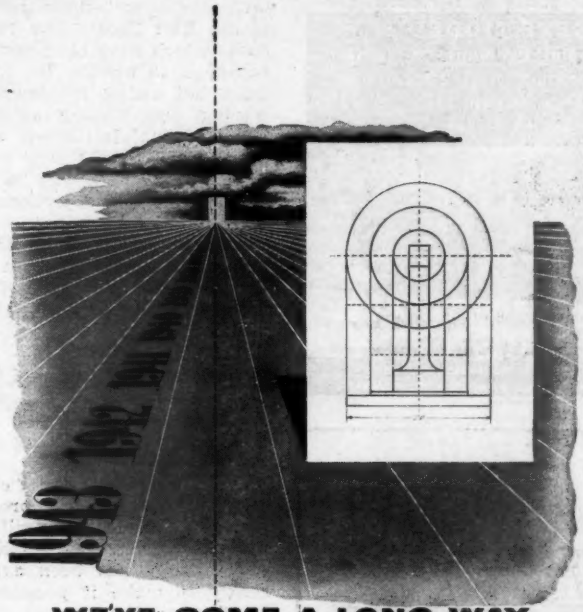
GEORGE H. McCARTHY, general manager of Franco Oils, Ltd., of Vermilion, Alta., is visiting United States refineries for the purpose of studying processes applicable to the treatment of Vermilion heavy crudes.

Kansas' 100-Octane Plant

NATIONAL Refining Co., Cleveland, Ohio, is constructing a 100-octane gasoline plant at its Coffeyville, Kans., refinery. The Coffeyville plant has crude capacity of 9,300 bbl. daily and a Dubbs cracking unit of 2,300 bbl. J. B. Gillam is superintendent; E. L. Richardson chief engineer and R. L. Vawter assistant superintendent.

Extensive Program

STANDARD OIL CO. OF NEW JERSEY is installing light ends fractionating plants at its New Jersey and Baltimore plants. The company also is installing one new pipe still and a fluid catalytic cracking plant at Baltimore, Md. All new equipment is expected to be in operation before this year ends.



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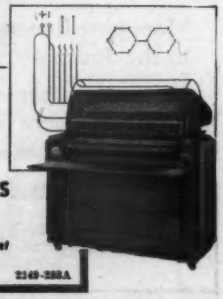

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PIPE LINES

WEP 24-In. Shipped More Than Tank Cars Could Take

During the past week shipments of crude oil through the WEP 24-in. line from Longview, Tex., to Norris City, Ill., were in excess of capacity of tank cars furnished for transshipment to the East Coast. The two loading racks which have been completed are equipped to handle 700 to 800 cars daily but owing to slowness in receiving cars loading at the Norris City terminal last week was at the rate of 250 to 500 cars per day. A third loading rack will be completed soon. Now that objectionable water contamination has disappeared, pipe lines have been taking 35,000 to 38,000 bbl. of crude oil daily from the northern end of the WEP system; the crude has a water content of less than 0.05 per cent.

At Norris City three 80,000-bbl. tanks have been built and three more are in the process of construction. Weather conditions have interfered with progress in building storage facilities there.

Installations at the "even numbered" stations have proceeded as fast as deliveries of auxiliary equipment has permitted. Sufficient pumping capacity has been available recently to make it possible to move oil through the line at the rate of 200,000 bbl. daily for certain periods.

More than 175 miles of 24-in. have been welded and tied in along the eastern extension of the WEP system. Of this amount, 160 miles are 24-in. and 15 miles 20-in.

At the Mississippi River crossing work is progressing on the east side at a point where it is necessary to dig a trench 40 ft. deep which will make it possible to bury a line low enough to conform with the Government's plans for future changes in the river channel.

Responsibility for designing delivery facilities for the eastern end of the WEP system has been assigned to W. G. Heltzel, vice president, Stanolind Pipe Line Co., who is attached to the WEP staff as special assistant. He is making his headquarters at Elizabeth, N. J., where he will be engaged in connection with the program for providing terminals at Linden, Bayway, Bayonne and Carteret, N. J., and Port Socony, N. Y.

Plans for moving No. 2 heating oil through the WEP 24-in. Longview-Norris City line had been postponed until April and will probably be postponed further since a number of practical difficulties have been presented. There is no early prospect of having sufficient tankage at Norris City. Two or three trial batches may be sent through in order to study methods for identifying the head of the stream and for observing the effect of possible paraffin deposits inside the pipe from crude oil which has been shipped through the line.

Although installations necessary for reversing flow have been made on pipe lines between Longview, Tex., and the Gulf Coast refining areas, none of these facilities have been used as yet for moving No. 2 heating oil for shipment through the WEP 24-in. line. It is believed that within a week after receiving orders to ship, the pipe lines involved in the program can deliver No. 2 heating oil at Longview.

Full credit is given to Secretary Ickes for foreseeing the need for a large-diameter line from Texas to the East Coast. On July 20, 1940, he first gave warning that such a project might be necessary. Before that time it does not appear that any line from Texas to New York was seriously planned.

Planning Proceeds for WEP 20-In. Products Line

In a statement in which he emphasized the urgent need for a 20-in. refined products line from Gulf Coast refining centers to the East Coast, Deputy Petroleum Administrator for War Ralph K. Davies concluded by reporting substantial progress on all preconstruction phases of the initial 836-mile Texas-Indiana segment of the pipe line.

Mr. Davies said: "Orders have been placed for all pipe required for the first leg of the line. Negotiations for motors, pumps, valves, transformers and supplemental equipment and materials will be concluded within the next few days. Construction crews will assemble shortly and construction work should be under way by the end of this month.

"Our construction schedule calls for completion of the first section of the pipe line by September 1, and I am confident that the pace set by the men who built the Texas-Illinois section of the War Emergency pipe line

from Texas to Norris City, Ill., in world-record time can be matched on the building of this second 'big inch'."

New England members of Congress approved last week a resolution urging the War Production Board to extend a second pipe line from Indiana to the East in time to forestall a fuel-oil shortage next winter. Although there has been effort made by certain interests toward extending the WEP system to New England, there is little likelihood that this will be done in the near future.

Kansas' Trunk Pipe-Line Capacity Is Increased

For the purpose of increasing capacity of systems so that they will be adequate for handling crude oil during periods of irregular movements, trunk-line organizations operating in Kansas are adding to their facilities. During the cold weather this year the running of full allowables from many leases has been delayed by the condition of oil in the tanks.

The program of Kaw Pipe Line Co. has made necessary the installation of a 300-hp. electric centrifugal pumping unit at the company's Susank, Kans., station which effects an increase of 10,000 to 12,000 bbl. daily for the double line from Susank to Chase, Kans. The company has asked for priority to lay 6 to 8 miles of 8-in. pipe needed for doubling the line from Susank to Gorham, Kans.

Stanolind Pipe Line Co. has applied for permission to do a small amount of looping to augment capacity of its system as far as Valley Center, Kans.

Skelly Lays Extension From Cunningham Pool

Construction is under way by Skelly Oil Co. for an extension of the company's crude-oil pipe-line system beyond Cunningham, Kans., to serve three pools. The project consists of approximately 28 miles of line, half of which is 6-in. pipe to the Iuka pool in Pratt County and the remainder is 4-in. pipe to the Kipp and Jordan pools in Stafford County.

The allowable for the three pools is about 1,600 bbl. daily. Recent practice has been to truck 300 to 400 bbl. daily from the three areas which will be served by the new line.

Stanolind Proceeds With Texas and Oklahoma Loops

In carrying out a looping program for enlarging trunk lines shipping north from Texas, Stanolind Pipe Line Co. has pushed construction at several points.

In North Texas, 53 miles of 8-in. loops for increasing capacity north of Mexia which was contracted by Jones & Brooks has been nearly completed. The status of loops contracted by I. C. Little is as follows: a 7-mile loop south of the Blake station, Oklahoma, has been completed; a 9-mile loop between Healdton and Pauls Valley, Okla., laying work is more than half done.

Leonard Expands Pipe-Line System

D. E. Beach, general manager of Leonard Pipe Line Co., announced that the company has received authorization to extend the 6-in. outlet of the Aetna pool from Winterfield, Mich., south another 7 miles to make a direct tiein with Sohio's main line into Mount Pleasant, Mich. The Winterfield and Freeman stations have been linked with a 4-in. line.

The first 12 miles of the system, between Aetna and Winterfield, was placed in service last week. Construction now is under way on the 7-mile extension from Winterfield to Freeman.

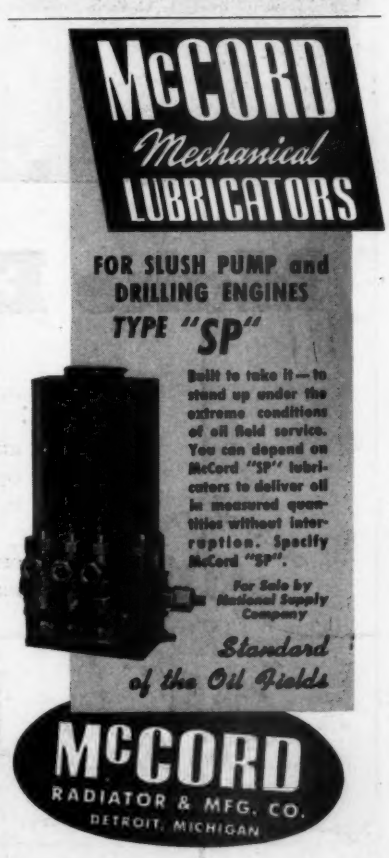
The new line will make it possible to pump about 20,000 bbl. of crude per day out of Aetna and Winterfield to the company's station at Freeman. The 4-in. line between Winterfield and Freeman will be adequate to meet transportation demands when three or more new wells are completed in Aetna within the next 10 days.

WPB Warns Oxyacetylene Industry of Shortage

Shortages of both oxygen and calcium carbide are anticipated by WPB during the early part of this year, members of the Oxygen and Acetylene Industry Advisory Committee were told at a meeting in Washington last week.

A recent survey of oxygen requirements compared with oxygen production indicates a serious shortage during the first half of 1943, government representatives told the members. This shortage may be aggravated and prolonged, depending upon the completion of new plants under construction. Members were asked to advise the Chemicals Division of places where conservation measures can be applied and where consumption can be reduced with the least hindrance to the war effort.

A discussion of calcium carbide, the raw material used for the production of acetylene, indicated that requirements will be considerably greater than production for several months, and possibly longer if current plant expansion and construction is further delayed. Stocks will be reduced to a bare minimum shortly, making necessary drastic cuts in allocations and probably curtailment of small orders.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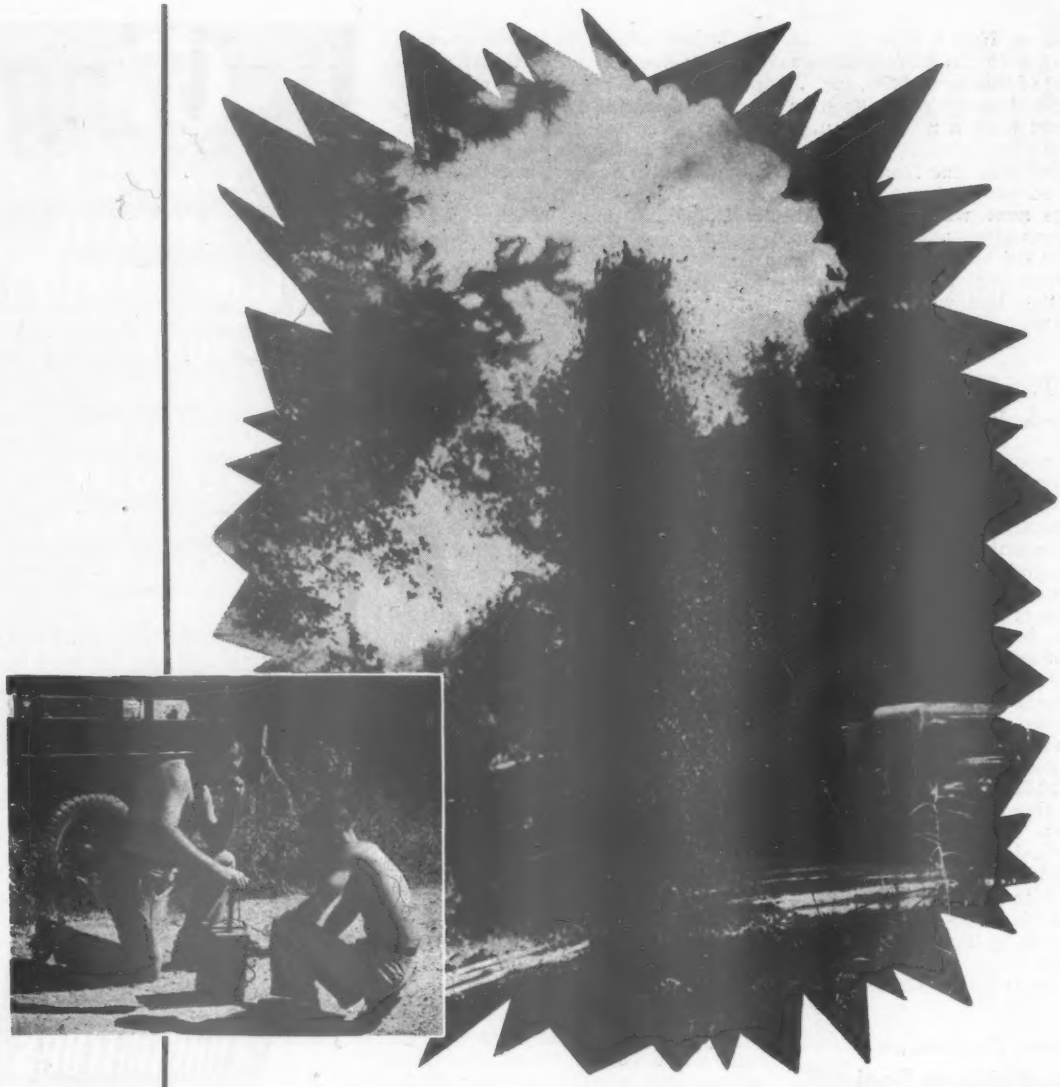

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Exploration and Drilling

Week's Highlights

IN the current emphasis on the lack of new important discoveries practically all of the discussion hinges on the price of crude and on the need for more wildcatting. The approaching annual meeting of the American Association of Petroleum Geologists suggests still another approach to the problem, namely the use of more geology. Many operators, ranging from independents to the largest of the majors, do not, apparently balance the cost of geology directly with that of a dry hole. At this time of high taxes, adding to the geological staff would not involve as much added expense as in normal times and the chances are very great that the investment of a few thousand dollars in geology would yield much greater returns than the drilling of a rank wildcat at much greater cost.

It is possible that many have forgotten that there are many types of geological work. Almost every operator employs geologists to find new structures, both independently and in conjunction with geophysical work. Geologists are employed on drilling wells to apply their geological knowledge to the proper completion of the well and to gathering material for further work in the immediate area. What appears to be necessary at this point is to finance the study of new areas and the development of new methods of finding oil. Few experienced geologists have either the time or the financial ability to take up this study as they are compelled to keep abreast of local developments in the areas in which they have specialized.

When a geologist is hired to perform a certain task, he is able to bring to bear on the problem a vast background of information which he has assembled over a period of years. But this information concerns the Permian basin, the Gulf Coast or the Los Angeles Basin. Much of it cannot be applied to the Williston basin of North Dakota. A few weeks in, say, the Green River basin of Wyoming is not sufficient for an adequate study of even a small part of the area, yet many operators feel that after a short examination, a geologist should be able to recommend an area for leasing and stake a location. During that time, he would hardly have been able to find and digest the available previously published material on the region.

Also, a geologist who has spent a decade or more learning about structures in a certain district may be unable to develop out of his experience the ability to handle a search for stratigraphic traps. It would not take an inordinate amount of time to acquire that ability as much of the material on which his study would be based is already available.

There are no priorities on the materials a geologist needs to undertake the study of a new area, a new type of oil field or a new technique of finding oil. What he needs is financial backing and time to work on the problem without interruption by demands for work on current problems. A well-planned geological reconnaissance might take a year or more and might save two dry holes.

WYOMING: A test in the Elk Basin field is reported to be flowing from the lower bench of the Tensleep horizon and may open a new deep pay (p. 102).

PERMIAN BASIN: The Embar-Ellenburger field of southern Andrews County has been extended ½ mile north and the Embar-Permian field has been extended ½ mile east (p. 97).

ILLINOIS: Oil has been recovered on a drill-stem test of a wildcat south of a recent Benoist discovery in White County and casing has been set to test McClosky saturation in an Effingham County wildcat (p. 90).

OKLAHOMA: The East Watchorn pool of Pawnee County has been extended nearly a mile north (p. 103).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended March 13, 1943)

	Oil	Gas	Dry	Total	Footage	Comp. to date 1943	Comp. to date 1942
N. Y., Pa., and W. Va.	45	15	3	63	122,094	576	749
Ohio	2	10	8	20	48,783	144	193
Indiana	4	0	1	5	9,617	51	70
Kentucky	1	3	0	4	8,394	41	52
Illinois	25	0	11	36	91,467	358	372
Michigan	5	0	4	9	20,091	75	137
Kansas	14	1	13	28	98,091	255	314
Nebraska	0	0	1	1	2,725	4	9
Missouri, Iowa	1	0	0	1	1,454	3	3
Oklahoma	9	2	11	22	70,191	211	315
Texas:							
North Central Texas	7	1	15	23	66,309	220	311
West Texas	9	0	2	11	52,885	161	403
Texas Panhandle	4	0	1	5	15,761	38	124
Eastern Texas	3	0	1	4	14,766	48	102
Texas Gulf Coast	3	0	6	9	59,706	74	187
Southwest Texas	11	1	2	14	74,293	164	272
Total Texas	37	2	27	66	283,720	705	1,399
North Louisiana	4	0	0	4	11,136	59	123
Louisiana Gulf Coast	6	0	2	8	78,152	64	124
Total Louisiana	10	0	2	12	89,288	123	247
Arkansas	2	0	3	5	24,987	43	32
Mississippi and Southeast	0	0	0	0	0	8	12
Montana	1	0	1	2	6,108	28	29
Wyoming	0	0	0	0	0	23	18
Colorado, Utah	0	0	0	0	0	1	4
New Mexico	2	1	4	7	19,120	40	53
California	16	0	4	20	72,017	189	202
Total United States	174	34	93	301	968,147	2,878	4,210
Total previous week	163	31	97	291			
Week ended March 14, 1942	164	21	84	269			

ILLINOIS FIELD REPORT

Oil Show in Palestine South Of Recent Benoist Discovery

MATTOON, Ill.—Outstanding development in Illinois fields during the past week was the recovery of free oil on a drill-stem test of the Palestine sand at 1,936-52 ft. in the W. C. McBride 1-A H. L. Hon et al, NE NW NE 6-4s-14w. On a 1-hour drill-stem test, operators recovered 36 ft. of oil and 30 ft. of oil-cut mud. The 1-A Hon et al is located a short distance south of the recent Benoist discovery drilled by N. V. Duncan on the Metcalf farm in the area southwest of Grayville. Duncan's discovery well recorded good shows of oil in pays above the Benoist, but the Palestine sand show encountered in McBride's well was unexpected.

The Magnolia Petroleum Co. 1 Vernie Nattier, SW SE 29-4n-1e, is waiting on cement to set with 7-in. casing landed at 1,567 ft. to test the Rosiclare at a plugged back total depth of 1,610 ft. This test was drilled as a Devonian test in old Patoka field, but 1-hour drill-stem test of that formation at a total depth of 2,969 ft. recovered only sulfur water. No recovery of oil or gas was reported and the well was plugged back to test a small showing of oil encountered in the Rosiclare. The 1 Nattier was drilled as a south offset to the Adams Oil & Gas discovery well of Devonian production in the field, and has halted further Devonian drilling, temporarily at least, especially to the south. However, Adams Oil & Gas Co. has locations staked for two Devonian offsets to the discovery—one east and one west. Exception permits to drill these tests have been applied for, and operations will probably get under way shortly after they are granted. These exception permits are required because there are old shallow sand wells on the 40-acre tracts now to be drilled for Devonian production.

The Kingwood Oil Co. has set casing to test a possible 6 ft. of commercial saturation in the McClosky limestone topped at 2,400 ft. The test is the 1 G. I. Earnest, NW SE NE 15-6n-5e, and it is about 1 mile north of Mason and about ½ mile north of production in the Mason pool. The operators set 5½-in. casing at 2,495 ft., and the total depth of the hole is 2,510 ft.

A small McClosky well seems assured in wildcat territory 2 miles northwest of Albion in Edwards County at the Nelson Development Co. 1 A. Reid, SE SW 16-1s-2e. Following treatment with 2,000 gal. of acid, the well swabbed 51 bbl. oil in 24 hours.

A Lower Ordovician test in the old Dupo field of St. Clair County, the Tarlton Oil Co. et al 1 A. Dyroff, NE SW SE 28-1n-10w, set 7-in. pipe to case off water at 1,480 ft. and is drilling ahead. This well is scheduled to drill to the Roubidoux formation which correlates with a similar Lower Ordovician formation in the Ellenburger group of West Texas

DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 13 crude oil	Mar. PAW quota all oils	Mar. 6 crude oil
Arkansas	70,800	78,700	72,100
California	779,500	823,700	774,150
Colorado	6,440	7,000	6,440
Eastern fields	89,000	115,000	100,500
Illinois	238,100	262,300	230,000
Indiana	16,000	16,500	14,500
Kansas	286,900	309,900	299,100
Louisiana	39,750	349,800	340,100
North Louisiana	*89,150*		*89,500*
Louisiana Gulf Coast	*250,600*		*250,600*
Michigan	61,100	63,700	57,900
Mississippi	53,850	50,000	54,950
Montana	17,680	23,400	21,900
Nebraska	2,400	2,800	2,550
New Mexico	105,610	105,800	105,090
Oklahoma	237,200	390,700	342,300
Texas	1,392,550	1,502,000	1,392,250
East Texas	*323,400*		*323,400*
West Texas	*218,000*		*218,000*
North Central Texas	*136,150*		*135,200*
East Central Texas	*99,800*		*99,800*
Texas Panhandle	*88,600*		*88,600*
Texas Gulf Coast	*458,950*		*459,600*
Southwest Texas	*67,650*		*67,650*
Wyoming	91,300	92,500	92,900
Total United States	3,878,180	4,193,800	3,906,730
Total production Jan. 1-Mar. 13, 1943			278,327,335 bbl.
Same period last year			291,842,720 bbl.

ILLINOIS COMPLETIONS

Wildcats

Clinton County: Al Schiermox 1 M. Laicx, NW SW NW 8-3n-2w, dry at 1,205 ft., Benoist sand 1,174 ft., Aux Vases 1,196 ft.

Derby Oil 1 C. Houkap, NW NE NE 15-1n-4w, dry at 3,278 ft., Glen Dean 748 ft., Golconda 822 ft., Cypress 937 ft., Weiler 975 ft., Paint Creek 1,005 ft., Benoist 1,070 ft., Ste. Genevieve 1,220 ft., Devonian 2,404 ft., Trenton 3,249 ft.

Effingham County: Walter Duncan 1 Kluthe, SE SE SE 33-6n-7e, pumped 210 bbl., natural, Cypress sand 2,517-40 ft., T.D. 2,540 ft., Bible Grove extension.

Kankakee County: St. Ann Pet. 1 V. A. Cotes, NW NW NE 2-29n-12w, dry at 783 ft.

Montgomery County: W. R. Holmes 1 Sewing, NW SE SW 28-8n-5w, dry at 699 ft.

St. Clair County: Dillworth-Hagger 1 Clingle, SW SE NE 18-1s-6w, dry at 2,363 ft., Cypress 510 ft., Ste. Genevieve 711 ft., St. Louis 785 ft., Devonian 1,695 ft., Trenton 2,257 ft.

Wabash County: Dean & Morton 1 E. Dunkel, N½ NW SW 5-1s-12w, dry at 2,076 ft.

Wayne County: Deep Rock 1 A. Atkinson, NW SE 12-2s-6e, dry at 3,344 ft., McClosky, 3,319 ft.

White County: N. V. Duncan 1 G. Calvin, NE SE SW 31-3s-14w, dry at 3,100 ft., Kincaid 1,864 ft., Degonia 2,006 ft., Clore 2,042 ft., Tar Springs sand 2,356 ft., Glen Dean 2,470 ft., Cypress sand 2,703 ft., Benoist sand 2,831 ft., Aux Vases sand 2,936 ft., Ste. Genevieve 2,998 ft.

E. M. Self 1 S. S. Knight, NE NE SW 15-7s-9e, dry at 2,648 ft. Weiler 2,636 ft.

Fields

Belle Rive, Jefferson County; Nash Redwine 2 E. Randolph, SW NE NW 34-3s-3e, pumped 47 bbl., oil and 5 bbl. water, shot 2,725-45 ft., Aux Vases sand 2,730-45 ft., T.D. 2,775 ft.

Bible Grove, Clay County: Kingwood 1 A. Lewis, SE NW SW 9-5n-7e, salt water disposal well, T.D. 2,015 ft.

Kingwood 3 A. Lewis, SE NW SW 9-5n-7e, pumped 474 bbl., Weiler 2,509-21 ft., T.D. 2,521 ft.

Blairsville, Hamilton County: Texas 1 Minton Comm., NE NE NE 20-4s-7e, flowed 323 bbl., Aux Vases sand 3,256-74 ft., McClosky 2,417-20 ft., T.D. 3,425 ft., P.B. 3,421 ft.

Boulder, Clinton County: Goldsmith & Murphy 4 fee, NE NW 2-2n-2w, flowed 276 bbl., Devonian 2,569 ft., pay 2,667-70 ft., T.D., 2,671 ft.

Cordes, Washington County: Magnolia 2 Paszewski, SW SW NE 23-3s-3w, pumped 7 bbl. oil and 13 bbl. water, shot 1,264 71 ft., Bethel 1,234 ft., T.D. 1,274 ft.

East Centerville, White County: Skelly 3 J. Stone, SE SW SE 7-4s-10e, pumped 60 bbl., shot 2,448-2,529 ft., Tar Springs sand 2,444-52 ft., 2,458-65 ft., 2,472-82 ft., 2,494-2,515 ft., T.D. 2,529 ft.

Friendsville, Wabash County: C. E. Skiles 3 Smalley, NE SE NE 3-1s-13w, pumped 75 bbl., acidized, Levias 2,600-05 ft., T.D. 2,606 ft.

Griffin, White County: Case-Pomeroy 39 Helm, NW SE NE 22-3s-14w, pumped 101 bbl. oil and 69 bbl. water, natural, McClosky, 2,874-86 ft., 2,903-07 ft., T.D. 2,923 ft.

Case-Pomeroy 38 Helm, N½ NW NE 27-3s-14w, pumped 145 bbl. oil and 61 bbl. water, natural, Tar Springs sand 2,165 ft., T.D. 2,916 ft., P.B. 2,191 ft.

Louden, Fayette County: Carter 2 C. Knapp, NE SW NE 20-8n-3e, pumped 27 bbl., shot 1,514-20 ft., Cypress sand 1,516 ft., T.D. 1,524 ft.

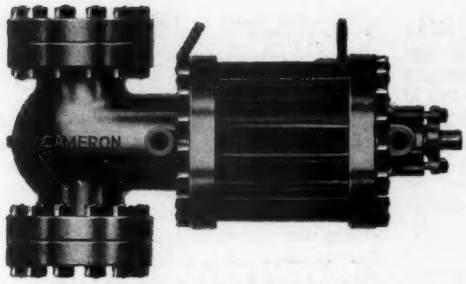
Carter 9-D Logsdon, SE SE 10-8n-3e, flowed 75 bbl. oil and 2 bbl. water, Devonian 3,040 ft., pay 3,130-31 ft., T.D. 3,131 ft.

Mount Carmel, Wabash County: Dean & Morton 4 Hein, S½ NW NE 21-1s-12w, pumped 40 bbl., shot 1,468-80 ft., Biehl 1,467-80 ft., T.D. 2,312 ft., P.B. 1,480 ft.

New Harmony, White County: Sun Oil 2 E. M. Riley, SW SW NW 31-4s-14w, pumped 126 bbl., shot 2,032-42 ft., Tar Springs sand 2,294-2,301 ft., 2,326-42 ft., T.D. 2,379 ft.

Noble, Richland County: Pure 34 Coen, S½

(Continued on Page 101)



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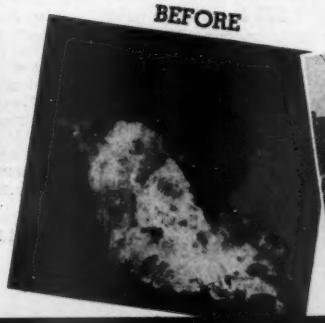


AFTER

EASTERN TEXAS FIELDS

Deep Test to Be Drilled in Southern Houston County

DALLAS, Tex.—Cherry & Kidd, Houston operators, have moved in on a deep wildcat test in southern Houston County, 5½ miles west of Crockett, in the John Grissett Survey, on the Moore Brothers farm. Contract calls for the test to penetrate the Woodbine formation 200 ft., and geologists estimate that a depth of 9,000 ft. will be necessary to accomplish this. The test is being drilled on a block of acreage assembled by Gulf Oil Corp. 10 years ago, and the wildcat must be completed by July 20 because of expiring leases.

In Anderson County, the Texas Co. 2 Greenwood, Keechi dome test in the R. B. Powers Survey, was drilling below 2,500 ft. in shale. Near Tucker, the test of Byrd-Frost, Inc., has been located 1,750 ft. from east, 2,435 ft. from north lines of the J. E. Box Survey, on the farm of Mrs. J. F. Marsh. Although first reports said this was to be a deep Paluxy sand test, permit application calls for a contract depth of 5,300 ft.

Verdict is due this week on Stanolind Oil & Gas 1-B Tri-Cities unit, Henderson County semiwildcat in the gas-distillate area 6 miles southwest of Athens. Porosity was encountered at 7,682 ft., but a core from 7,780-90 ft. recovered 2 ft. hard brown lime, and another from 7,790-7,800 ft. recovered 1½ ft. lime with no porosity. Drill pipe was stuck at 7,830 ft. at last report. Same company's 1-D Tri-Cities unit, in the same area, was drilling below 6,820 ft.

EAST TEXAS COMPLETIONS

Wildcats

San Augustine County: Roper & Todd 2 Long-Bell Lumber Co., Hayden Sur., elev. 179 ft., O.W.D.D., O.T.D. 4,000 ft., dry, N.T.D. 4,720 ft.

Fields

Hawkins, Wood County: Humble 3 Shamburger, Jos. Pollock Sur., elev. 440 ft., flowed 295 bbl., pay 4,418-28, 4,864-72 ft., T.D. 4,890 ft. sand.

Quitman, Wood County: Delta Drlg. and Shell Oil 1 Blalock-Goldsmith, 410 ft. from W, 660 ft. from S, S. G. Purse Sur., elev. 475 ft., flowed 737 bbl. 42.7° gr., pay 6,306-12, 6,332-52, 6,370-75 ft., T.D.

Weiland, Hunt County: Stanolind O. & G. (was W. F. Nenny) 1 Greenville Lake & Water Co., 1,320 ft. N, 475 ft. E of SE cor. I. Handlin Sur. but in Jno. Warren Sur., elev. 492 ft., pumped 213 bbl., pay 2,763-70 ft., Woodbine sand, T.D. 2,786 ft.

In Van Zandt County, Royal Petroleum Co. 1 Key, 2½ miles southeast of Wills Point, was shut down for orders after sticking drill pipe at 2,250 ft. The test had been drilled to 5,512 ft. in shale with no shows reported, and will likely be abandoned as dry.

The Quitman and Hawkins fields of Wood County continue to be the most active in the East Texas district, although a new test was announced for the Flag Lake Woodbine sand pool in western Henderson County last week. It is Stewart Oil Co. 1 Nolan, 1,850 ft. from north, 330 ft. from west lines N. Parsons Survey. In the Quitman field, Barnsdall Oil Co. 1 N. J. Kirkland is located on the southwest side of the field, 660 ft. from east, 535 ft. from north and south lines of 40-acre tract in the E. Goodsir Survey. It is a south offset to Amerada 1 Blalock, which was drilling below 5,598 ft. in lime. East of the Coke field, Amerada 1 G. A. Turner, Smackover lime test, was drilling below 4,575 ft. in shale. Bobby Manziel 1 W. F. Bailey, 5 miles southeast of the Coke field, was drilling ahead after logging water in Woodbine sand at 4,685 ft. It is a Paluxy sand test.

N. CENTRAL TEXAS

Well in Walnut Bend Pool Has Large Flow From Winger Sand

WICHITA FALLS, Tex.—Sinclair Prairie Oil Co. 9 D. A. Cox, on the southeast flank of the Walnut Bend pool of northeast Cooke County, was completed for 1,771 bbl. oil per day from the new pay opened on the east side of the pool by same company's 1 Winger a month ago. The new producer, located 752 ft. from north, 912 ft. from east lines of Block 68, Fannin County School Land Survey, topped the "Winger" sand at 5,477 ft. after drilling through a good show in sand at 5,437-50 ft., drilled on to total depth 5,511 ft., and perforated with 175 shots 5,479-5,509 ft. and again with 75 shots 5,439-49 ft. Elevation of the well is 750 ft.

In the same area, Sinclair Prairie 10 D. A. Cox, Block 60, Fannin County School Land, is drilling below 2,700 ft., and 11 Cox is drilling below 1,200 ft. Sun Oil 1 Bacon, Block 70, Fannin County School Land, was coring at around 5,145 ft., testing the upper sands producing in the pool proper.

In Clay County, the wildcat of Continental 1 Stephens, G. W. Tipps Survey, 2 miles north of Buffalo Springs, was drilling below 3,140 ft. in shale. In Jack County, Gwynn & Overby 1 J. W. Kinder, E. Pearce Survey, 8 miles southwest of Jacksboro, is drilling ahead below 3,875 ft. after a brief shut down to repair motor. North of Post Oak, Youngblood & Foree 1 Fulcher, Z. N. Morrel Survey, was drilling at about 3,800 ft. in shale. The same operators are drilling below 4,150 ft. at 1 J. S. Berry, Edward Stephens Survey, southwest Wise County, but no information is being released on formations. This well lies about 6 miles east of Joe Worsham 1-A Meador which was abandoned this week after showing oil and gas in Ellenburger topped at 6,020 ft. It is on a magnetometer high.

In Young County, west of Eliasville, the closely watched test of Hanlon-Buchanan 1 Mooney, in the Mooney Survey just north of the Stephens County line, was setting casing at about 4,310 ft. A show of oil was reported from both the lower Strawn and the Caddo, but the well is to test the Mississippi which paid off so handsomely in Texas Pacific Coal & Oil 12 Hill, about 6 miles southeast.

Young County continues to lead in drilling activity in the North Texas district, with five deep wildcats drilling, although Jack County is a close second with four wells actually drilling and a like number inactive.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: Paul B. Scott 1 J. J. Perkins, Blk. 48, Bell Co. Sch. Land, dry, T.D. 1,500 ft.

Jack County: Shell Oil 1 L. N. Wolfe, 481 ft. from E, 425 ft. from S Sec. 3341, TE&L Sur., Bryson sand 3,210-28 ft., Caddo 4,342 ft., Barnett 5,334 ft., Ellenburger 5,582 ft., IP 69 bbl. oil, 1,000,000 cu. ft. gas, pay 4,375-4,463 ft., lime, P B & perf. from T.D. 5,631 ft. Discovery.

Joe A. Worsham 1-A. L. A. Meador Est., Lot 22, Henderson Co. Sch. Land, Ellenburger 6,020 ft., est. 750,000 cu. ft. wet gas, dry, T.D. 6,142 ft.

Montague County: Continental 1 A. V. Fleming, 330 ft. from S and W of 115-acre tract, F. Secrest Sur., A-665, dry, T.D. 3,810 ft.

Fields

Burns-Ragland, Young County: Hanlon-Buchanan 2 Charles Hunter, 1,101 ft.

from N, 1,867 ft. from W 200 acre-tract Sec. 290, TE&L Sur., A-537, Caddo 4,030 ft., Mississippi 4,945 ft., junked, T.D. 4,969 ft.

Consolidated-Ellenburger, Wilbarger County: Consolidated Oil 2-K G. B. Ancell, Jr., 330 ft. from N and E S½ NW¼ Sec. 2, Blk. 7, H&TC Sur., IP 765 bbl., pay 4,291 ft., lime, T.D. 4,300 ft.

Davenport, Montague County: Lesh & McCall 2 W. A. Reed, 1,263 ft. from N, 1,624 ft. from W 124-acre lease, T. J. Robinson Sur., pumped 100 bbl., pay 2,386-2,545 ft., T.D. 2,850 ft.

Rogers Bros. Drlg. 1 W. B. Grimes est., 330 ft. from S and W W. B. Ramey Sur., A-630, elev. 935 ft., slight show oil 3,095-3,115 ft., granite 3,514 ft., dry T. D. 3,539 ft.

Jermyn, Jack County: Charles H. Kadane 2 Lester Carter, Sec. 3311, TE&L Sur., dry, T.D. 345 ft.

Charles H. Kadane 3 Lester Carter, Sec. 3311, TE&L Sur., dry, T.D. 300 ft.

KMA, Wichita County: Grace & Grace 1 J. E. Roller est., 100 ft. from N, 25 ft. from E, R. J. Scott Sur., A-256, IP 98 bbl. and 17 per cent water, pay 4,048 ft., shot 200 qt., T.D. 4,112 ft.

Rogers & Rogers, Montague County: Rogers Bros. Drlg. Co. 1 Joe Benton, NE NE NE P. J. Benton Sur. A-117, dry, T.D. 5,315 ft.

Thornberry, Clay County: Akin-Dimock 9 J. C. Saner, Lot 35, Saner Subd., IP 20 bbl., pay 1,112 ft., sand, T.D. 1,124 ft.

J. C. Bernard et al 2 B. L. Hansard, Lot 3, Thornberry Subd., dry, T.D. 1,158 ft.

Fortex Oil 4 Dallas Jt. St. Land Bank, lot 35, Jane Duncan Sur. A-112, IP 100 bbl., pay 1,143 ft., T.D. 1,153 ft.

Fortex Oil 5 Dallas Joint Stock Land Bank, Lot 35, Jane Duncan Sur. A-112, dry, T.D. 1,361 ft.

W. P. Staton 1 J. Stephenson, Lot 50, Specht Subd., dry, T.D. 1,207 ft.

Walnut Bend, Cooke County: Sinclair Prairie Oil 9 D. A. Cox, 725 ft. from N, 912 ft. from E Blk. 68, Fannin Co. Sch. Land, elev. 750 ft., flowed 1,771 bbl., pay 5,437 ft., T.D. 5,511 ft.

WEST CENTRAL TEXAS

ABILENE, Tex. — Rig is being moved into a new deep wildcat test in southeast Parker County, the Devonian Oil Co. 1 Raymond Buck, 1,980 ft. southwest of the northeast line, 660 ft. northwest of the southeast line of lease in Section 2, I.&G.N. R.R. Survey, Block 9, 9 miles southeast of Weatherford. Location is on a large block of leases assembled in 1940, and later worked with geophysics. The test is slated to go to a depth of 6,300 ft., and will furnish lacking information for correlation in the Fort Worth basin.

Interest in the West Central Texas district is picking up, with several new wildcat locations in the offing. In Jones County, 3½ miles southwest of Truby, Watchorn Oil & Gas Co. has staked 1 Ray (Hampton), in C SW NW Section 11, Block 17, T.&P. R.R. Survey. Midway between the Noodle and South Noodle pools, R. H. Roark has staked his 1 Sears, NW NW NE Section 37, Block 18, T.&P. R.R. Survey. In Taylor County, Drilling & Exploration Co. has made plans to deepen a well drilled last year south of Merkel, the 1 Gibson, which went to 3,202 ft., to the Palo Pinto formation. Just south of the Jones County line, Butler & Horne Drill-

(Continued on Page 97)

SOUTHWEST TEXAS

Additional Sand to Be Tested At Jim Wells County Wildcat

CORPUS CHRISTI, Tex.—Sam E. Wilson, Jr., and D. Auld were preparing to test the 7,300-ft. sand at their 1-A Maria S. de Garza, in Jim Wells County, following an inconclusive test from perforations at 7,920-27 ft. This wildcat, a Shell Oil Co. farmout, is 5 miles northeast of Falfurrias. A 9-hour drill-stem test through a ¼-in. choke at the bottom and ⅝-in. choke at the top, using a 3,200-ft. water cushion, started the water cushion flowing within 17 minutes. The top choke was changed to ⅜-in. After the tool had been open 30 minutes the maximum pressure reached 1,750 lb., and the well flowed gas, distillate and some of the water cushion. In 8 hours the pressure fell to 800 lb. While the tool was closed the shut-in pressure built up to 4,000 lb. in 20 minutes.

Phillips Petrolum Co. 1 William Huermann, 5 miles south of the Turkey Creek field, in Nueces County, was at 8,176 ft. in shale and testing with perforations at 7,202-8 ft. It got gas and a small quantity of wash water through the ¾-in. choke. Tubing pressure was 2,250 lb. and casing pressure 2,500 lb.

Seaboard Oil Co. 1 Julia Rzeppa, which opened the new Hobson field in Karnes County, has been officially completed with initial production of 151 bbl. of 31.8-gravity oil through 5/32-in. choke, with perforations at 4,000-10 ft. Tubing pressure was 800 lb., shut-in casing pressure 1,500 lb., and gas-oil ratio 795. The well is about 17 miles northwest of Phillips 1 Reasoner, which opened the new Hondo Creek field a few weeks ago. It is 14 miles south of the Poth pool, in Wilson County. The top of the Wilcox was logged at 4,029 ft.

Dirks Bros. 2 C. S. Page estate, in Bee County, was still under test at total depth of 7,982 ft. and perforations at 7,840-50 ft. A 30-minute drill-stem test through ¼-in. choke, with packer at 7,830 ft., produced 3-lb. working pressure and recovery of 100 ft. of slightly oily mud.

Sun Oil Co. was fishing for a twisted-off drill collar at its 1 D. D. Oil Co., 2½ miles northwest of Gateway, in Hidalgo County. It had recovered twisted-off drill pipe lost at 6,840 ft. and had drilled less than 400 ft. when the fresh trouble appeared.

Continental Oil Co. got a show of oil, with salt water, through perforations at 1,432-36 ft., at its 1 Albert W. West., a mile and a half southeast of Oakville, in Live Oak County, now at 2,704 ft. in shale. Tubing pressure was 50 lb. The crew killed the well and started a squeeze job.

Humble Oil & Refining Co. was drilling in sandy shale at 5,408 ft. in its 1 Donata Benevides, 3 miles north of Pescadito, in Webb County. It topped the Carrizo at 3,250 ft.

New wildcat locations staked in the South Texas area were H. J. Porter et al 2-A J. Dunn, Diego Ynojosa Grant Survey, Duval County, and Sal Vieja Oil Co. 3 J. S. Riser, in the Mountain View area of Live Oak County.

LOWER GULF COAST COMPLETIONS

Wildcats

Karnes County: Seaboard 1 Julia Rzeppa, 7 mi. S of Falls City, 151 bbl. through 5/32-in. choke, T.P. 800 lb., S.I. C.P. 1,500 lb., gas-oil ratio 795, perf. 4,000-10 ft., T.D. 4,803 ft., P.B. 4,012 ft., discovery, name Hobson field.

Fields

Agua Dulce, Nueces County: Richardson Petroleum Co. 2 Clara Driscoll, Palo Alto grant, 140 bbl. through ⅛-in. choke, T.P. 990 lb., C.P. 2,110 lb., gas-oil ratio 796, T.D. 6,563 ft.

Bentonville, Nueces County: Sun 2 E. M. Brownlee, Agua Dulce grant, 73 bbl. through 73/64-in. choke, T.P. 1,625 lb., C.P. 2,100 lb., gas-oil ratio 3,950, T.D. 5,719 ft.

Seeligson, Jim Wells County: Shell 13 L. Seeligson, Willis Millican Sur., 197 bbl. through 7/64-in. choke, T.P. 1,150 lb., C.P. 1,210 lb., gas-oil ratio 744, perf. 5,910-22 ft., T.D. 5,975 ft.

Sun 20 P. Canales, J. E. Stevers Sur. 364, 107 bbl. through ¼-in. choke, T.P. 225 lb., C.P. 775 lb., gas-oil ratio 536, T.D. 6,049 ft.

Transwestern Oil Co. 1-B Seeligson estate, H. D. Koopman Sur. 235, 68 bbl. oil through 5/64-in. choke, T.P. 1,600 lb., gas-oil ratio 1,325, perf. 5,900-5 ft., 17,000,000 cu. ft. gas through 2-in. hole in casing, C.P. 2,075 lb., S.I. C.P. 2,275 lb., T.D. 6,251 ft.

South Caesar, Bee County: Luling Oil & Gas Co. 7-WB Tom Slick, W. F. Hodges Sur. A-175, 86 bbl. through ⅛-in. choke, T.P. 350 lb., C.P. 1,150 lb., gas-oil ratio 360, perf. 6,591-99 ft., T.D. 6,601 ft.

Stratton, Kleberg County: Humble 31 King ranch-Paso Ancho, Paso Ancho de Abajo grant, 142 bbl. through ⅛-in. choke, T.P. 1,020 lb., gas-oil ratio 600, T.D. 6,669 ft.

SOUTH TEXAS COMPLETIONS

Wildcats

McMullen County: Stanolind 1 J. F. Henry, 3 mi. NW of Tilden, dry at 6,800 ft.

Fields

Aviator, Webb County: O. W. Killam 1 Puig Bros., 1 mi. E of Mirando City field, dry at 2,512 ft.

Cadena, Duval County: Taylor Refining Co. 1-B Genero Garcia, Blackstone Hardeman Sur., 45 bbl. through 13/64-in.

(Continued on Page 103)

CALIFORNIA

Testing Continues at Mendota Wildcat; Second Well Started

LOS ANGELES, Calif. — Texas Co. has apparently found enough encouragement in its Mendota wildcat to justify additional exploration because a second well is being started on the Gill property in 16-13s-16e and this area may bear watching. The original wildcat drilled in this region was bottomed at 9,154 ft. and a series of tests is now under way. A string of 7-in. casing has been cemented at 7,967 ft. and the company is alternately gun-perforating, testing and squeezing. On a gun-perforated interval at 7,805-15 ft. and 7,820-30 ft. and open for 60 minutes with a packer at 7,770 ft. the recovery consisted of salt water. After squeezing this section, perforations were made at 7,480-7,500 ft., and with a packer at 7,458 ft. the recovery consisted of 6,250 ft. of salt water. This interval was then squeezed and gun perforations made at 5,618 ft. and 5,725 ft. and again the recovery consisted of salt water. Tests are now under way higher up in the hole. The fact that salt water was found in all of the intervals tested would ordinarily prove unfavorable but the company's engineering staff apparently believes that the well is low structurally and that a more favorably located well might show more encouragement. There does not appear to be any question that this well will show commercial gas production as a formation test during the course of drilling revealed a potential of from 5,000,000 cu. ft. to 10,000,000 cu. ft. of gas daily.

Much Equipment Being Salvaged From Old Wells

Considerable salvage work is under way in California fields especially in the San Joaquin Valley in order to provide additional strings of casing. In many of the older wells, flow strings were landed and the principal salvage work now under way consists of recovering these superfluous strings which for the most part are well preserved and in good shape. Standard Oil Co. started this work several months ago in the Midway-Sunset field but at present all operators have salvage work under way if they have any wells that contain oil strings. This casing after recovery is carefully inspected and cleaned in the usual manner after weak spots have been removed. This salvage work has enabled operators to proceed with the drilling and completion of numerous shallow wells in San Joaquin Valley fields as this material can be used to advantage in fields containing productive zones around 1,000 ft.

New Producer in Lower Wagonwheel at North Belridge

The North Belridge field of Kern County has not appeared prominently in recent development reports due to restricted drilling and the recycling program instituted in that field several months ago. For this reason the recompletion several weeks ago of 9-27 fee of Belridge Oil Co. in the 2-Y or second Wagonwheel zone of Eocene age at 9,084 ft. is interesting. This well is interesting because of the unusually low gas-oil ratio which it shows and the high pressures involved. Present production is 550 bbl. of relatively clean 31.7-gravity oil and 445,000 cu. ft. of natural gas. Production is coming through a 4/64-in. bean behind pressures of 2,250/1,700 lb. The upper Wagonwheel zone has always been characterized by high gas-oil ratios and this was responsible for the initiation of the present program that contemplates the restoration of all gas produced into the productive measures. The zone found a year or so ago by Tide Water Associated Oil Co. between the lower Temblor and upper Wagonwheel zone will probably become a factor of some importance in the future by permitting the expansion of drilling operations to the northwest. The conservation program under way in the North Belridge field of Kern County is a progressive step in the right direction even though it forced a number of operators to shut in high gas-oil-ratio wells. The survey conducted at that time revealed the fact that if production activities had continued uninterrupted for any great length of time it would result in considerable waste. Before the pumping stage had been reached the survey showed that about 75 per cent of the natural gas would have been produced and recovered only about 15 per cent of the crude oil in the reservoir. This condition has been corrected by shutting in high gas-oil-ratio wells.

SAN JOAQUIN VALLEY COMPLETIONS

Antelope Plains, Kern County: Shell Oil Co. 66-6 Williams, 6-28s-20e, pumped 85 bbl. net, 16.3-gravity, 45 per cent cut, T.D. 2,407 ft., P.B. 2,200 ft., perf. 2,175-2,200 ft., 1-B oil zone 2,100 ft., 2-B oil zone 2,364 ft., well has been on extended production test for several weeks account water cut, completed in upper or 1-B zone of Miocene age.

Shell Oil Co. 75-6 Williams, 6-28s-20e, flowed 252 bbl., 16.7-gravity, 2 per cent cut, 21/64-in. bean, flow pressure 130 lb., T.D. 2,789 ft., P.B. 2,500 ft., perf. 2,460-2,500 ft., 1-B oil zone 2,285-2,462 ft., 2-B oil zone 2,62-85 ft., completed in 1-B oil zone of Miocene age.

Belridge, South, Kern County: General Petroleum Corp. 29-12 Belridge fee, 12-29s-21e, pumped 32 bbl. net, 13.5-gravity, 15 per cent cut, T.D. 1,083 ft., 100-mesh perf. 811-1,082 ft., completed in upper Belridge zone of Pleistocene age.

General Petroleum Corp. 30-12 Belridge fee, 12-29s-21e, pumped 52 bbl. net, 13.5-gravity, 23 per cent cut, T.D. 1,090 ft., 100-mesh perf. 825-1,090 ft., completed in upper Belridge zone of Peistocene age.

Coalinga, East, Fresno County: Shell Oil Co. 104-2 fee, 2,20s-15e, pumped 40 bbl., 19.8-gravity, 2.5 per cent cut, T.D. 3,483 ft., P.B. 3,255 ft., 160-mesh perf. 3,074-3,253 ft., black shale 3,080-94 ft., Kreyenhagen 3,452 ft., completed in East Coalinga zone of Pliocene age.

Dodgeland wildcat district, Butte County: Superior Oil Co. 1 Dodge Lands, 31-20n-1e, abandoned in basalt, 7,858-88 ft., T.D. 7,888 ft., form. test 5,459-5,519 ft., flowed 1,000,000 cu. ft. gas, no other showings logged.

Kern Front, Kern County: Standard Oil Co. 16-5 fee, 5-28s-27e, pumped 95 bbl., 13.6-gravity, 5 per cent cut, T.D. 2,830 ft., perf. 2,631-2,828 ft., M point 2,450 ft., N point 2,554 ft., Q point 2,635 ft., S point 2,786 ft., completed in Kern Front zone of Pliocene age.

Kern River wildcat district, Kern County: General Petroleum Corp. 1 Wakefield Community, 15-28s-28e, abandoned in gray sand, Vedder zone of Miocene age was barren at this location, T.D. 2,898 ft., no important showings of oil or gas logged.

Midway-Sunset, Kern County: Standard Oil Co. 88-7-D fee, 7-32s-24e, pumped 31 bbl., 27.3-gravity, 7 per cent cut, T.D. 2,912 ft., 60-mesh perf. 2,655-2,910 ft., completed in Midway zone of Pliocene age.

Round Mountain, Kern County: Honolulu Oil Corp. B Coffee Canyon, 18-28s-29e, pumped 140 bbl., 13.8-gravity, 30 per cent cut, T.D. 1,881 ft., 100-mesh perf. 1,844-79 ft., completed in Vedder zone of Miocene age, 1,845-81 ft.

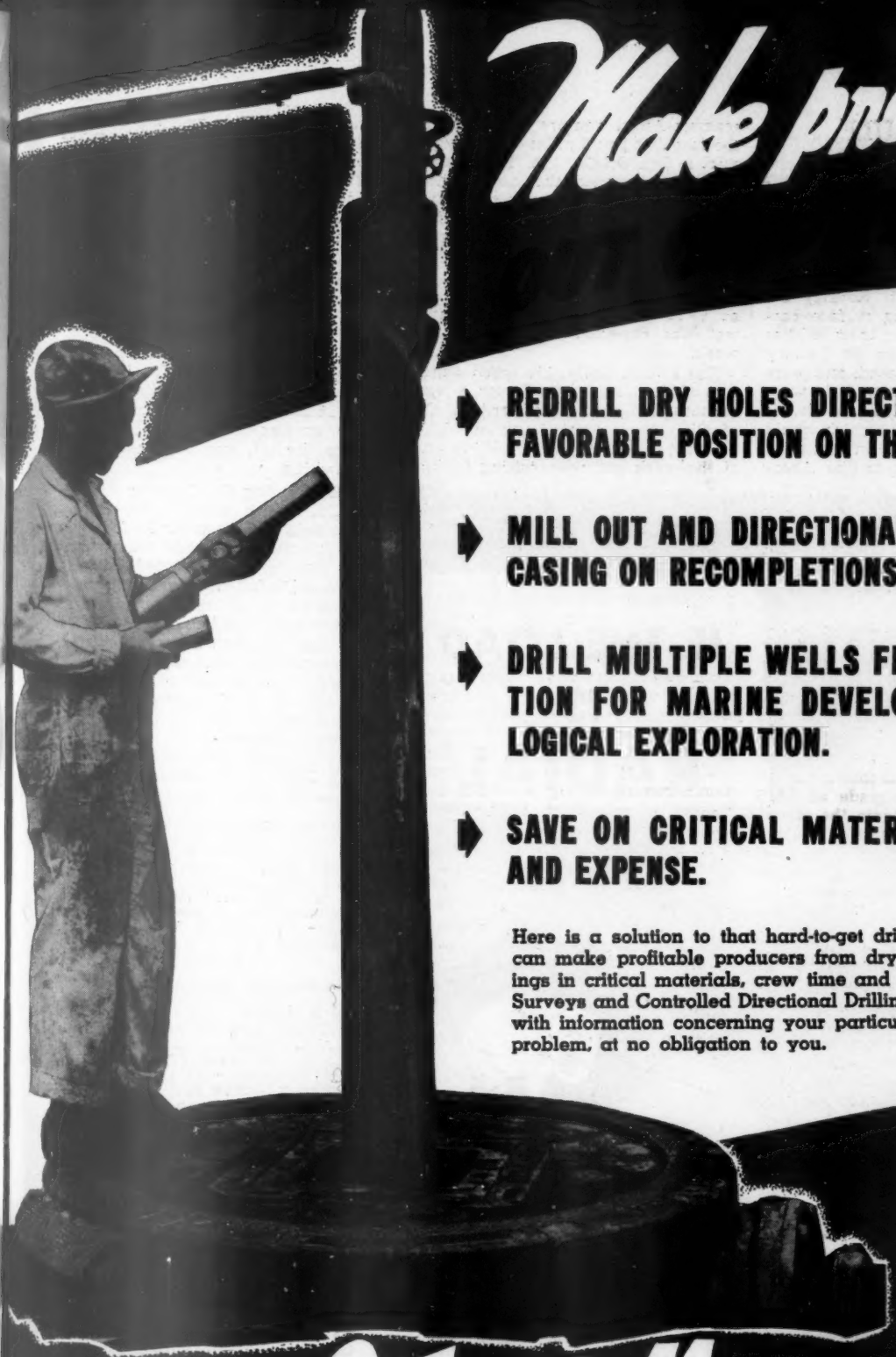
New Drilling at Huntington Beach

The staking of seven additional locations by Signal Oil & Gas Co., one by Southwest Exploration Co. and six by Standard Oil Co. indicates the Huntington Beach field of Orange County will receive additional consideration in the immediate future as far as new drilling is concerned. Drilling operations of Signal Oil & Gas Co. will be on the Bolsa lease which it secured a year or two ago while Standard's projected drilling will be located on the Huntington A property. The well to be drilled by Southwest Exploration Co. will be a tideland project to be bottomed beneath the Huntington tidelands by directional drilling and at a predetermined point. Standard Oil Co. has also staked locations for seven new wells to be drilled in the Montebello field where the company has finished a number of small wells during the past several months. The zone to be developed in this field is reached at 2,750 ft. and yields an 18-gravity crude that is highly desirable.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: Southwest Exploration Co. 12 State, 4-6s-11w, pumped 205 bbl., 24.1-gravity, 0.2 per

(Continued on Page 104)



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LOUISIANA GULF

Surface Casing Set at Deep Test in St. Landry Parish

NEW ORLEANS, La.—J. S. Abercrombie and Atlatl Royalty Co. had completed running surface casing to about 2,000 ft. at their wildcat test, 1 Charles unit, in St. Landry Parish, as the week closed, and were ready to resume drilling. This well, 2 miles southwest of Leonville, is slated to go to 12,000 ft., which would make it the deepest hole in that area. New interest attaches to the Abercrombie-Atlatl venture by reason of the fact that just 6 miles to the southwest is Sun Oil Co. 1 A. T. Burleigh, which has opened the new Sunset field. The Burleigh, total depth 11,505 ft., plugged back to 9,578 ft., underwent a 24-hour gage last week, during which it flowed 168 bbl. through 9/64-in. choke. Tubing presure was 1,150 lb., casing pressure 0. Perforations are at 9,495-9,505 ft. Official potential test was expected to be taken this week.

The 1 J. R. Daily, 1¼ miles southeast of Egan, in Acadia Parish, a joint venture of Sun and Standard Oil Co. of Ohio, is at total depth of 10,007 ft. It set 9⅝-in. casing at 8,667 ft. and at the week end was waiting for the cement to set. This well has reached the original contract depth and has been taken over by Sun, which will drill the hole about 1,000 ft. deeper. Union Sulphur Co. 1 J. P. Gueno, in the Branch area of Acadia Parish, which spent several weeks fishing for a long string of drill pipe lost when the well blew out last fall, plugged back to 10,170 ft. and was preparing to sidetrack. Depth of the original hole was 10,447 ft.

American Republics Corp. 1-X Lutcher-Moore Lumber Co., in Beauregard Parish, was drilling ahead from 12,257 ft. when drill pipe stuck while coming out of the hole to change the bit, and at latest report was fishing.

Gulf Refining Co. 1 Delta Securities Co., which opened the Bayou Couba field in September 1942, began making salt water, and then went dead, has been abandoned after a workover job failed to restore production. A series of tests was made at various levels, the last at 3,080-87 ft., when the well swabbed wash water, mud, sand, and salt water, with a negligible percentage of oil. Total depth of the 1 Delta was 6,917 ft., plugged back to 6,543 ft. It was temporarily abandoned last January 7 after producing altogether 2,880 bbl. of oil. There are no other producing wells in the field.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Vermilion Parish: Humble 1 Louisiana Furs, Inc., 27-16s-1e, 8 mi. SW of Schooner Bayou field, 10.1 bbl. distillate and 730,000 cu. ft. gas through ⅛-in. choke, T.P. 4,150 lb. T.D. 12,057 ft., P.B. 10,854 ft.

Fields

Anse la Butte, St. Martin Parish: George H. Echols et al, 1 St. Germain, 114-9s-5e. dry at 10,383 ft.

Anse la Butte, Lafayette Parish: Stanolind 2 J. C. Nickerson, 43-9s-5e, 227 bbl. through ⅛-in. choke, T.P. 1,250 lb., C.P. 1,100 lb. gas-oil ratio 674, perf. 9,880-9,905 ft., T.D. 10,346 ft.

Bayou Couba, St. Charles Parish: Gulf 1 Delta Securities Co., 13-15s-21e, O.W.W.O., old T.D. 6,917 ft., new P.B. T.D. 6,543 ft., abandoned

Fausse Point, Iberia Parish: Texas 11 State-Lake Fausse Point, 26-11s-8e, 228 bbl. through 10/64-in. choke, T.P. 735 lb., gas-oil ratio 380 perf. 8,690-8,712 ft., T.D. 8,715 ft.

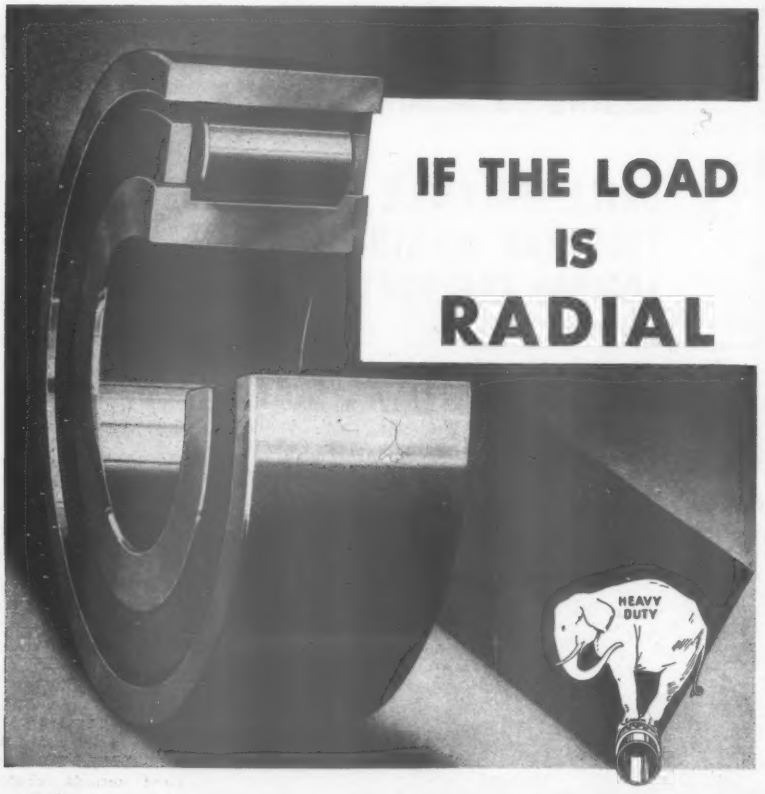
Jennings, Acadia Parish: Stanolind 16 Houssiere Latreille, 47-9s-2w, O.W.W.O., old T.D. 7,222 ft., new P.B. T.D. 6,918 ft., 91 bbl. pumping, T.P. 90 lb., C.P. 1,000 lb.

Lake Salvador, St. Charles Parish: Texas 18 State-Lake Salvador, Lake-16s-23e, 173 bbl. through ½-in. choke, T.P. 1,500 lb., gas-oil ratio 1,500, perf. 10,545-73 ft., T.D. 10,918 ft.

Raceland, La Fourche Parish: Amerada 12 South Coast Corp., 35-15s-19e, dry at 9,620 ft.

Vinton, Calcasieu Parish: Union Oil Co. of California 6-G J. G. Gray, 33-10s-12w. 157 bbl. through ½-in. choke, T.P. 800 lb., C.P. 830 lb., perf. 5,635-55 ft., T.D. 5,837 ft.

Ville Platte, Evangeline Parish: Continental 3 and 5 Martha Hass, Trustee, Well 1. 119 bbl. oil and 128,000 cu. ft. gas through 12/64 in. choke, T.P. 400 bl., C.P. 1,800 lb., perf. 10,204-33 ft., T.D. 10,276 ft, P.B. 10,242 ft.



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Heavy-Duty ROLLER BEARINGS

Embar-Ellenburger and Permian Fields Extended North and East

MIDLAND, Tex.—Both the Embar-Ellenburger and Embar-Permian fields of southern Andrews County were extended last week. One-half mile north of Ellenburger production Phillips 28 University-Andrews became the ninth producer in the pool when it flowed 325 bbl. in 8 hours through ¾-in. choke while cleaning out after wash of 500 gal. acid. The 5½-in. casing, cemented at total depth 8,010 ft., was perforated from 7,995 ft. to 8,006 ft. One-half mile east of Permian production, Phillips 37 University-Andrews, at total depth 6,250 ft., was treating with 500 gal. acid in the Clear Fork zone of the Permian after setting 5½-in. casing at 6,207 ft. The test had swabbed 3 bbl. per hour before acid treatment. Pumping test on Phillips 1 University-Andrews, the first well drilled in the field, which was dry in the Ellenburger at total depth 8,368 ft. on July 12, 1941, recovered 79 bbl. oil plus 12 per cent water on recompletion from the Clear Fork at 6,180-6,281 ft. It is the fifth well to produce in the Embar-Permian field.

The Crockett County wildcat which promises to open a new field, Moore 1-12 Shannon, Section 12, Block FF, John Small Survey, was reacidizing with 3,000 gal. after swabbing only 1 bbl. per hour after first treatment of 1,000 gal. Same operators' 1-21 Todd, deep test in Section 21, Block YZ, E.L.&R.R. Survey, took drill-stem test from 6,795-6,876 ft. and recovered 400 ft. oil-cut drilling fluid in 20 minutes. A second drill-stem test failed and hole was being reconditioned for another try. Moore 1-21 Shannon, 2 miles north of the above test, was fishing for bit at 2,570 ft.

In Pecos County, Gulf Oil 1 Rooney Mercantile Co., Section 82, Block OW, was shut down for orders at total depth 5,423 ft. in Delaware formation. No shows of oil or water were encountered. Phillips 1 Ada Price, 27 miles southeast of Fort Stockton, was still drilling close to 9,700 ft. Magnolia 1-29 Eaton, southwest of the Abell pool, was drilling lime and shale at 7,530 ft.

Deep failure for southeast Sterling County was Ohio Oil 1 Clark, which drilled to total depth 8,486 ft. where circulation was lost. Drill-stem test from 7,671-7,871 ft. recovered only mud, and the test was plugged back to 2,941 ft. to run another drill-stem test in the Permian zone. Ellenburger was topped at 7,705 ft. Col-Tex Refining Co. 1 Reed, in northwest Sterling County, was drilling below 8,746 ft. in black shale, no shows reported.

In Winkler County, Magnolia 20 State-Walton cored from 9,875-94 ft. and recovered 15 ft. green shaly sand with no oil or gas shows, and was reaming core holes preparing to drill ahead. Shell 1 Blue, eastern Winkler County, was shut down for orders at total depth 9,437 ft. in lime.

WEST TEXAS COMPLETIONS

Wildcats

Borden County: Cosden Petroleum 1 Ida A. Smith, SE SW Sec. 57, Blk. 25, H.&T.C. Sur., elev. 2,333 ft., anhydrite 1,720 ft., lime 2,240 ft., dry, T.D. 4,000 ft.

Fields

Embar, Andrews County: Phillips 32 Univ.-Andrews, SW SW Sec. 29, Blk. 10, Univ. Sur., elev. 3,229 ft., flowed 151 bbl. 42.7 gr., pay 6,206 ft., perf. 6,228-48 ft., T.D. 6,350 ft.

Howard-Glasscock, Glasscock County: Aragon Oil 2-C M. M. Edwards, 1,186 ft. from S, 2,130 ft. from E Sec. 16, Blk. 33, T. 2s, T.&P. Sur., elev. 2,577 ft., pumped 29 bbl., 31 gr., pay 2,098 ft., T.D. 2,104 ft.

Slaughter, Cochran County: J. C. Hawkins 26-A Mallet, SW Lab. 17, Lge. 47, Edwards Co. Sch. Land, elev. 2,639 ft., flowed 781 bbl. 32 gr., pay 4,914 ft., acid 11,500 gal., T.D. 4,963 ft.

Slaughter, Hockley County: T. F. Morrow 23 Mallet, NW Lab. 18, Lge. 48, Edwards Co. Sch. Land, flowed 612 bbl., pay 4,890 ft., acid 12,000 gal., T.D. 4,939 ft. lime.

Wasson, Gaines County: Mabee O. & G. 1-B Oil Dev. Co., 660 ft. from S, 2,130 ft. from E Sec. 39, Blk. AX, Public Sch. Land, elev. 3,521 ft., flowed 558 bbl. 33.5° gr., pay 4,970 ft., 12,000 gal. acid, T.D. 5,040 ft.

Seminole, Gaines County: Amerada 5 R. W. Robertson, NE SW Sec. 196, Blk. G, G.W.T.&P. Sur., elev. 3,337 ft., flowed 256 bbl. 35 gr., pay 5,168 ft., acid 2,000 gal., T.D. 5,260 ft.

Wasson, Yoakum County: Bay Petroleum 1 Sadie O'Dowd, 440 ft. from N and W 240-acre lease, Sec. 806, Blk. D, J. H. Gibson Sur., elev. 3,531 ft., flowed 441.6 bbl., 30.5° gr., pay 4,990 ft., T.D. 5,151 ft.

Honolulu Oil 13-A Bennett, 440 ft. from S, 1,980 ft. from E Sec. 614, Blk. D, J. H. Gibson Sur., elev. 3,584 ft., flowed 260 bbl., 33° gr., pay 5,238 ft., T.D. 5,301 ft.

Plymouth Oil 1-C Bennett, 660 ft. from S, 510 ft. from W of NW¼ Sec. 630, Blk. D, J. H. Gibson Sur., elev. 3,594 ft., flowed 386 bbl., 34° gr., pay 5,203 ft., T.D. 5,270 ft.

West Andrews, Andrews County: Phillips 26 Univ.-Andrews, SW NW Sec. 20, Blk. 10, Univ. Sur., elev. 3,255 ft., dry, T.D. 4,507 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M.—Southeast New Mexico's two deep wildcat tests were drilling ahead with no change reported as the week ended. In southeast Lea County, R. Olsen Oil Co. and Atlantic Refining 1 Langlie, SE SE 11-25s-37e, had topped the Ellenburger at 9,100 ft. and had penetrated this formation to a depth of 9,377 ft. in dolomite with no shows. In Quay County, Stanolind Oil & Gas 1 J. W. Fuller, NE NE 25-8n-30e, was drilling in shale at total depth 6,431 ft. In Otero County, H. L. Hunt Oil Co. and Fred Turner 1 McMillan, SW SE 5-26s-16e, set 8⅝-in. protection string through caving shale at 1,812 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcats

Lea County: Argo Oil 1 Shiloh-State, SE SE 20-20s-35e, elev. 3,727 ft., anhydrite 2,020 ft., sand 2,060 ft., Yates 3,820 ft., salt water 4,179-87 ft., dry, T.D. 4,187 ft.

B. H. Nolen 1 W. M. Snyder, NE NE 29-19s-36e, elev. 3,726 ft., Yates 3,403 ft., show gas 4,580-85 ft., show oil 4,740-50 ft., salt water 4,990 ft., dry, T.D. 5,003 ft.

Fields

East Lusk, Lea County: Carper Drlg. et al 2 Miller, NE SW 19-19s-32e, elev. 3,554 ft., acid 1,600 gal., salt water 2,679-82 ft., dry, T.D. 2,682 ft.

Grayburg-Jackson, Eddy County: Western D. & E. 6-C Keely, NE NW 26-17s-29e, elev. 3,578 ft., I.P. 260 bbl., pay 2,766 ft., acid 500 gal., T.D. 2,868 ft. lime.

Red Lake, Eddy County: A. H. Hover 1 Aregood-State, NW SE 31-17s-31e, elev. 3,520 ft., dry, T.D. 528 ft.

PANHANDLE COMPLETIONS

Gray County: Phillips Pet 1 Bascla, NW SW Sec. 177 Blk. B-2, H&GN Sur., elev. 3,243 ft., IP 119 bbl., 43.6° gr., pay 2,979 ft., T.D. 2,995 ft.

Sun Oil 1 Combs & Worley, 770 ft. from E, 1,244 ft. from S SW¼ Sec. 34, Blk. 3, I&GN Sur., elev. 3,072 ft., show oil 2,810-16, lime dry, T.D. 3,371 ft.

Hutchinson County: Skelly Oil 2 D. D. Harrington, SW NE Sec. 20, Blk. M-16, AB&M Sur., elev. 3,346 ft., IP 37 bbl. 39° gr., pay 3,259 ft., PB to 3,264 ft. T.D. 3,300 ft.

Phillips Pet. 66 Whittenburg, 330 ft. from N, 731.6 ft. from E, Sec. 59, Blk. 46, H&TC Sur., elev. 2,906 ft., IP 152 bbl., pay 2,790 ft., T.D. 2,878 ft.

Shamrock O. & G. 4 Stewart, NE SE Sec. 19, Blk. M-16, AB&M Sur., elev. 3,336 ft., IP 149 bbl., pay 3,210-17 ft., Dolomite, T.D. 3,217 ft.

West Central Texas

(Continued from Page 93)

ing Co. et al 1 J. O. Zant, 1,650 ft. from the east, 330 ft. from the south line of 428-acre tract in the David Bruce Survey, 2½ miles south of the Wimberly pool.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: Hunter & Hunter & F. K. Jonhson 1 M. S. Martin, 660 ft. from N and W Sec. 69, Blk. 14, T&P Sur., dry, T.D. 2,103 ft.

Thomasson 1 W. M. Wright, 330 ft. from N and E of lease, Jesse Dyson Sur., elev. 1,766 ft., dry, T.D. 2,659 ft.

Fields

Prichard, Callahan County: Anderson-Prichard 2 Sealy-Smith, 1,980 ft. from N, 2,130 ft. from W. Sec. 121, Blk. 2, GH&H Sur., dry, T.D. 3,094 ft.

Rock Crusher, Coleman County: Sohio Prod. Co. 1 W. C. Ray, Sec. 667, J. P. McLean Sur., elev. 1,940 ft., dry, T.D. 3,228 ft.

Santa Anna, Coleman County: Coleman Gas & Oil 1 Geisecke, 1,700 ft. from S, 660 ft. from E, H. F. Adams Sur., Sec. 10, elev. 1,632 ft., IP 4,000,000 cu. ft. gas., pay 2,213-55 ft., 4,000 gal. acid, T.D. 2,259 ft.

APPALACHIAN FIELDS

Western Pennsylvania Well To Test Newburg Horizon

PITTSBURGH, Pa. — A second test in Mercer County, western Pennsylvania, is drilling to the Newburg gas-producing horizon, the Lockport dolomite, and it will be of interest as the discovery well 1,500 ft. to the southeast on the Minnis farm in Worth Township, was the first commercial well in Pennsylvania from that horizon. The new well is being drilled by the United Natural Gas Co. and is on the Maude Davidson farm and it is now 1,500 ft. deep. The Newburg is an erratic gas pay found in Ohio.

In Maryland, the test of William E. Snee et al on the Speicher farm on the Accident dome in Garrett County is drilling at 6,924 ft. and the shale is dark brown and black-gray. The first darkening of the shale was at 6,600 ft. but alternate lighter gray has been drilled through. The blackish shale suggests the region of the Tully lime, which thins out so as not to be identified. The hole is finding a section unlike that in the other two tests on the structure.

On Laurel Ridge in Ligonier Township, Westmoreland County, William E. Snee et al are hauling in pipe to case 1 John and Eleanor Brack to 7,276 ft. Petrographic study of the samples places the Burkette shale (Genesee) at 6,701-6,858 ft. or slightly lower than in the Indiana Savings & Trust lease on the Menocher Highway. The difference may be due to the deviation of the hole from vertical of 700 ft.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Mahoning Township: John Wray et al 1 Lon Allen, 400,000 cu. ft. gas after shot, through Bradford sand, T.D. 3,582 ft.

Clarion County, Monroe Township: Hill Bros. 1 Harry McCall, 116,000 cu ft. gas, Speechley sand, R.P. 350 lb., T.D. 2,653 ft.

Porter Township: T. W. Phillips Gas & Oil Co. 2 John Brown, 38,000 cu. ft. gas, Murraysville, Fourth, Speechley and Sheffield sands, T.D. 3,136 ft.

Greene County, Center Township: Manufacturers Light & Heat Co. 1 Ica Stewart, dry through Elizabeth sand, T.D. 3,477 ft.

Jackson Township: Manufacturers Light & Heat Co. 1 M. S. Stockdale, 25,000 cu. ft. gas, Big Injun 2,308-2,558 ft., gas 2,388 ft., through Elizabeth sand, T.D. 3,563 ft.

Perry Township: James Furman et al 1 fee, 520,000 cu. ft. gas, Murphy sand 633 ft., gas 715-18 ft., T.D. 718 ft.

WEST VIRGINIA

In McDowell County the deep test of Godfrey L. Cabot, Inc., on the John Gilbert farm is drilling at 5,529 ft. It is in Browns Creek district. In Huff Creek district, Wyoming County, this operator is drilling at 4,050 ft. on the 1068 John Gilbert with a show of gas not enough to gage at 3,520 ft. In Baileysville district, Wyoming County, 1076 John Gilbert is drilling at 2,132 ft. in the Maxton with 59,000 cu. ft. of gas at 2,100 ft., which blew down to 21,100 ft.

WEST VIRGINIA COMPLETIONS

Braxton County, Salt Lick: L. D. Nutter 1 J. W. Steele-Nicholson, 610,000 cu. ft. gas, Berea sand, T.D. 2,847 ft.

Calhoun County, Sherman district: Hope Natural Gas Co. 2353 J. H. Roberts, drilled deeper, 198,000 cu. ft. gas, Big Injun sand, T.D. 2,122 ft.

Gilmer County, Glenville district: Pittsburgh & West Virginia Gas Co. 1 John E. Arbuckle, 10,065 cu. ft. gas, Big Injun, T.D. 2,018 ft.

Jackson County, Ravenswood district: Columbian Carbon Co. 695 F. E. Spicer, dry, through Berea sand, T.D. 2,601 ft.

Lincoln County, Sheridan district: Kanawha Gas & Utilities Corp. 1 R. E. Sloan, drilled deeper, 33,330 cu. ft. gas before shot, Berea started deepening 1,303 ft., T.D. 1,921 ft.

Raleigh County, Trap Hill district: Godfrey L. Cabot, Inc. 1063 Rockhouse Fork Land Co., dry, no Berea present, T.D. 3,890 ft.

Putnam County, Pocatalico district: Godfrey L. Cabot, Inc. 2 Black Betsy Land Co., 84,000 cu. ft. gas, Big lime, will acidize, T.D. 1,719 ft.

Upshur County, Meade district: Hanley & Bird 2 Matheny & Davis, 251,000 cu. ft gas, Gordon sand, T.D. 2,271 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: United Carbon Co. 1101 M. L. Casto, 2,431,000 cu. ft. gas, Oriskany 5,020-58 ft., shot 5,029-53 ft., R.P. 1,410 lb., T.D. 5,064 ft.

Spartan Gas Co. 5 W. E. Walker, 2,823,000 cu. ft. gas, Oriskany 5,027 ft., R.P. 1,025 lb., T.D. 5,044 ft.

Putnam County, Union district: Godfrey L. Cabot, Inc. 1080 J. L. McLeans heirs, 1,309,000 cu. ft. gas, Oriskany 4,970 ft., gas 4,972-87 ft., R.P. 1,750 lb.

Kanawha County, Poca district: Columbian Carbon Co. 688 C. J. Holmes, 4,763 ft., Oriskany 4,850 ft., gaging 249,000 cu. ft. gas at 4,876 ft.

MICHIGAN

Van Buren County Wildcat Completed as Small Pumper

SAGINAW, Mich.—A break in northern Michigan's abnormally cold March weather has made possible a decided pickup in drilling activity with the result that more definite information concerning the prospects for a new field in the Cedar Creek section of Osceola County should develop shortly. Meanwhile, last week nine tests were completed in seven counties, five resulting in oil production ranging from 10 to 70 bbl. a day and including a small wildcat producer in Huron Township of Wayne County.

The wildcat, Voorhees Drilling Co. 1 Gumtow & Gibbs, Section 18, produced 10 bbl. a day on the pump after acidizing at 2,653 ft. The 70-bbl. producer is a Fisher-McCall and Keeler development in Section 9 of Bangor Township, Van Buren County; but these operators also completed a dry hole in the same section. Gulf Oil Co. added another 40-bbl. producer to its Kawkawlin Township, Bay County, string, and in Bentley of Gladwin County, Sun Oil Co. reported production of 50 bbl. a day from 1 Davis at 3,254 ft. after plugging back on a deep test from 5,114 ft.

Meanwhile the state Conservation Department considered another auction of oil and gas lease rights on state-owned land after reporting operators have made application to lease some 20,000 acres in Wexford and Osceola counties, principally, and also have evidenced interest in potential offerings in Mecosta, Lake, Clare, Missaukee and Midland counties.

Drilling permits issued for 1943 climbed to 68 last week as seven were issued, three for tests in Osceola County, two in Mecosta's Fork Township, one in Roscommon and for a wildcat exploration in Ingham's Wheatfield Township.

MICHIGAN COMPLETIONS

Allegan County, Manlius Township: W. Spencer Cook 1 Joostberens, NE SW NW 12-3n-15w, wildcat test, dry, T.D. 1,461 ft.

Otsego Township: Robert B. Patrick 1 Volker and Stone, NE NW 30-1n-12w, pumping 10 bbl. and salt water, acidized, T.D. 1,454½ ft.

Bay County, Kawkawlin Township: Gulf Refining Co. 1 Jeske, S½ SE SW 27-15n-4e, pumping 40 bbl., acidized, T.D. 2,935 ft.

Gladwin County, Bentley Township: Sun Oil 1 Davis et al, SE SE 17-17n-2e, flowing 50 bbl. (est.), T.D. 3,580 ft., P.B. from 5,114 ft.

Gratiot County, Sumner Township: Chartiers Oil Co. 1 Hale et al, SW NW NE 35-11n-4w, wildcat test, dry, T.D. 3,254 ft.

Muskegon County, Cedar Creek Township: James F. Campbell 1 Sharp, S½ NE NW 29-11n-15w, wildcat test, dry, T.D. 1,164 ft.

Van Buren County, Bangor Township: Fisher-McCall Oil & Gas Co.-M. Bliss Keeler 1 Batka-Knapp et al, SW SE NW 9-2s-16w, pumping 70 bbl., acidized, T.D. 1,015½ ft.

Fisher-McCall Oil & Gas Co.-M. Bliss Keeler 2 Davis, SW NE NE Sec. 9, dry, T.D. 1,040 ft.

Wayne County, Huron Township: Voorhees Drilling Co. 1 Gumtow and Gibbs, NE SE NE 18-4s-9e, wildcat test, pumping 10 bbl., acidized, T.D. 2,653 ft.

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EVERYTHING BULLARD IN SAFETY

CANADIAN FIELDS

Repressuring Experiment Undertaken in Turner Valley

CHATHAM, Ont. — An experiment in repressuring which, if successful on a limited scale may be adopted throughout Turner Valley, has been undertaken by a group of Anglo-Canadian Oil Co. affiliates in the original west-flank crude area of South Turner Valley. Under an agreement between the Alberta Conservation Board and the Anglo-Canadian Oil Co., waste gas from the Frontier, Sundance and Prairie producers is being returned to the formations through the old Foundation Royalties well, which is no longer a crude producer. All the wells concerned belong to the Anglo-Canadian group.

This is the first time in the history of the Turner Valley field that waste gas, which would otherwise be burned in flares, is being returned to the formation. Since the completion of the first Madison lime naphtha producers in 1924-25, millions of cubic feet of residual gas have been burned daily in the field, there being no market for the product after supplying the Canadian Western Natural Gas requirements and normal drilling and local community demands. Though conservation restrictions have had some effect in reducing this wastage, in December it totaled 1,546,981,000 cu. ft. This wastage endangers the pressure necessary for efficient crude petroleum production. While the limited experiment now undertaken primarily affects only the Anglo-Canadian group of wells, its success and the general adoption of the plan would, it is believed, help maintain reservoir pressures and result in a greater ultimate recovery of crude from the field.

The Conservation Board order with respect to the Frontier well limits gas production to 2,000,000 cu. ft. in one of every 7 days, with a daily return to the Foundation well of 250,000 cu. ft. for each of the remaining 6 days. The Sundance well is permitted to produce 26,000,000 cu. ft. in 90 days, with the return of specified amounts to the formation through the Foundation well. Some variations will probably be made as the experiment progresses.

Devonian Deep Test

In West Central Turner Valley, Devonian Test 1, LSD 2, 25-19-3w5, is below 6,829 ft. after getting the upper Blairmore formation at 5,730 ft. Drill is apparently in the Home sands, with the Madison limestone expected around 7,350 ft. Drilling will be carried through the Madison and the Banff shales to test the underlying Devonian limestone.

Armelgra Test

In southeastern Alberta, Imperial-Armelgra 1, LSD 16, 19-13-13w4, remented off the limestone formation where water was encountered at 3,131 ft. A 24-hour swabbing test of the Ellis formation between 3,100 and 3,124 ft. produced 15 bbl. of oil and 2 bbl. of water. Pumping equipment will be installed for a conclusive production test, though the well is not expected to be commercial. If fair results are obtained, other wells will likely be drilled in the same general area.

Dominion Company Formed

Dominion Oil Co. is being organized to take over the exploratory and development operations in Alberta previously carried on by Standard Oil Co. of British Columbia. The latter company will continue to handle the importation, refining and marketing of petroleum in British Columbia with R. D. Baker in charge as executive vice president. Both the Dominion and Standard of British Columbia companies are wholly owned subsidiaries of Standard Oil of California, which will finance exploration activities of the Dominion company. The latter will complete drilling of Standard of British Columbia 1, LSD 4, 17-2-22w4, in the Ross Lake area of southern Alberta, now drilling below 5,449 ft. and will operate the Standard-Province crude producer at Taber, where a second well will be drilled.

Income-Tax Concessions

The new Canadian federal budget contains a number of concessions to oil operators intended to encourage new drilling. Preproduction expenses of any oil well may be written off against income over a 4-year period, with 40 per cent the first, 30 the second, 20 the third and 10 the fourth. It is not necessary to take the full amounts in the case of wells commenced between January 1, 1943, and March 31, 1945, but amounts not used may be carried forward, or in the alternative preproduction expenses may be written off more rapidly as the operator may desire. Depreciation rate on assets used in oil production, including drilling equip-

(Continued on Page 105)

Sheridan County Wildcat Opens Studley Pool

UNION Oil Co. of California's wildcat in Sheridan County was completed for 175 bbl. of oil a day, opening the Studley pool. The well, 1 Pratt Ranch in NW NE SW 23-8-26w, is the first production in the county and is the California company's first well in Kansas. Production is coming from the Lansing-Kansas City lime series at 3,899 ft. Total depth is 4,444 ft. Perforations at 3,808-17 ft. filled the hole 2,600 ft. with oil in 40 minutes and started to flow in 1 hour and 15 minutes. Additional perforations were made at 3,810-17 ft. and swabbing at the rate of 60 bbl. of oil an hour, the fluid was lowered 250 ft. in 3 hours. Gravity of the oil is 41.1 corrected.

Another northwest Kansas wildcat being watched is Helmerich & Payne and Phillips Petroleum Co. 1 Savage, CNE 3-1-27w. It was drilled to 3,685 ft. in granite and plugged back to the Lansing-Kansas City lime, topped at 3,311 ft., for testing.

A number of good pool wells were completed. In the Southwest Lindsborg area, Auto-Ordnance 2 Bengstrom pumped 607 bbl. in Viola at 3,376-86 ft. to become the fifth in a rapidly expanding field. Continental Oil Co. 1-A Barry, NE SE SE 2-9-19w, offset production in the new Barry pool, swabbed 120 bbl. of oil in 3 hours in Arbuckle at 3,438-62 ft. A show of oil and porosity was found in lime at 3,173 ft. Some of the largest wells in the Peace Creek pool are being found on the central eastern side. Cities Service 2-C Heylmun, SW SW NE 12-23-10w, pumped 472 bbl. of oil in Viola at 3,746-58 ft.

KANSAS COMPLETIONS

Wildcats

Barber County: Olson Oil 1 McClain, SW NE 20-31-11w, dry, T.D. 4,502 ft., Lansing 3,825 ft., Mississippian chat 4,488 ft.

Butler County: Rex & Morris and Wolf Creek Oil 1 Allen, NE NW SW 1-26-3e, pumped 15 bbl., Mississippi lime 2,678-85 ft., T.D. 3,021 ft. in Viola, P.B. 2,720 ft.

Graham County: N. Appleman 1 Buss, NW NE SW 1-9-22w, dry, T.D. 3,810 ft., Lansing 3,464 ft., conglomerate 3,788 ft., reworked Arbuckle 3,807 ft.

Skelly 1 John Mills, SW SW SE 2-6-23w, dry, T.D. 3,996 ft., Lansing 3,598 ft., conglomerate 3,882 ft., Arbuckle 3,966 ft.

McPherson County: Republic Natural Gas 1 Henry Burk, NE NE SW 7-18-1w, dry, T.D. 2,815 ft., Mississippian chat 2,784 ft.

Phillips County: Allan and Co-Operative 1 Skelton, NE NW 13-2-19w, pumped 72 bbl., Lansing 3,414-95 ft., T.D. 3,737 ft.

Reno County: Falcon-Seaboard 1 Stevens, SW NE NE 10-22-8w, dry, T.D. 3,900 ft., Mississippi lime 3,510 ft., Misener 3,640 ft., Hunton 3,644 ft., Viola 3,784 ft., Simpson sand 3,820 ft., shale 3,834 ft., Arbuckle 3,891 ft.

Fields

Barry, Rooks County: Continental 1-A Barry, NE NE SE 2-9-19w, swabbed 120 bbl. in 3 hr., Arbuckle 3,438-62 ft.

Bemis, Ellis County: Texas 2 Johansen, SW NE 34-11-17w, dry, T.D. 3,754 ft., Arbuckle 3,744 ft.

Bloomer, Ellsworth County: Bartlett et al 1 Reese, SE NW 34-17-10w, dry, T.D. 3,357 ft., Arbuckle 3,332 ft.

Chase, Rice County: Lario Oil & Gas 2 Link, SW SW SW 17-19-9w, pumped 54 bbl., Arbuckle 3,245-60 ft.

Crowther, McPherson County: Winkler-Koch 2 Blessing, S½ SE NE 27-17-1w, pumped 396 bbl., Mississippian chat 2,723-37 ft.

East Frog Hollow, Cowley County: Blair and Continental 2 Allen, NE NE SW 14-32-5e, dry, T.D. 3,118 ft., Mississippi lime 3,116 ft.

Eberhardt, Barton County: Vickers 3-A Herr, N½ SW SE 24-19-11w, dry, T.D. 3,365 ft., Arbuckle 3,322 ft.

Burnett, Ellis County: Champlin Oil & Ref. 1-A Meier, SE SE NW 36-11-18w, old T.D. 3,601 ft., T.D. 3,998 ft., dry, recompleted.

Gorham, Russell County: Coralena 1 Benso, E½ NE SW 9-14-15w, pumped 371 bbl., Lansing 3,052-58 ft., T.D. 3,275 ft.

Iuka, Pratt County: Hollow Drlg. 1 Beck, SW NW SW 6-27-12w, dry, T.D. 4,280 ft., show oil 4,207 ft.

Hollow Drlg. 1 Linbacker, SW SW SE 3-27-13w, dry, T.D. 4,476 ft., Arbuckle 4,461 ft.

Kraft-Prusa, Barton County: Carter 2 Steuder, SW SE 10-17-11w, pumped 903 bbl., Arbuckle 3,318-25 ft.

M. P. Springer 3 North Oeser, NW NW 30-16-11w, pumped 159 bbl., Gorham 3,338-49 ft.

Lindsborg Southwest, McPherson County: Auto-Ordnance 2 Bengstrom, W½ NE SE 25-17-4w, pumped 607 bbl., Viola 3,376-86 ft., T.D. 3,519 ft.

McLouth, Jefferson County: O. J. Connell 3 Mossberger, E½ NE NE 28-9-20e, 2,000,000 cu. ft. gas, sand 1,310 ft., T.D. 1,322 ft.

Peace Creek, Reno County: Cities Service 2-C Heylmun, SW SW NE 12-23-10w, pumped 472 bbl., Viola 3,746-58 ft.

Penokee, Graham County: Cities Service 1-B Hutton, SE NE NE 12-8-24w, dry, T.D. 4,100 ft., Arbuckle 4,067 ft.

Silica, Barton County: Virginia Drlg. 3 Clawson, SE SW 17-20-11w, pumped 412 bbl., Arbuckle 3,302-06 ft.

Stanolind 3 Panning, NW SE NW 33-19-10w, old T.D. 3,300 ft., T.D. 3,820 ft., input well.

Stoltenberg, Ellsworth County: Texas 6 Schroeder, SW SW 27-16-10w, pumped 175 bbl., Arbuckle 3,277-89 ft.

Wakeeny, Trego County: Max Cohen 1 Howat, SW NE SW 26-11-23w, dry, T.D. 4,078 ft., Arbuckle 4,062 ft.

Zenith, Stafford County: Derby Oil 2 McNickel, E½ SE NE 1-24-11w, flowed 81 bbl. in 4 hr., potential 2,919 bbl., Viola 3,719-46 ft.

Magnolia 2 Darr, NW NW 6-24-10w, flowed 47 bbl. an hr., Viola 3,701-34 ft.

FOREST CITY BASIN

ST. JOSEPH, Mo.—Northwest Missouri is waiting for two Bartlesville sand tests to be started in the Tarkio vicinity of Atchison County. One is O. R. Newcomer et al 1 Joseph Francis Acock, SE NW 8-64n-39w, and the other is J. E. Palensky et al 1 White estate, SE SE SE NE 11-64n-40w. The former location is approximately 2 miles south of the Cities Service Oil Co. discovery, 1 Cook, and the latter is some 4 miles to the southwest of that well.

Ferguson & Towle 1 Della Ehbauer, NW NW NE 2-2n-15e, Richardson County, Nebraska, had the Mississippi lime from 2,050-55 ft. and was drilling below 2,120 ft. This test is about ½ mile from the old I. T. I. O. 1 Bankers Life. This well had a show of oil in the Hunton lime.

In the McLouth, Kans., oil and gas pool, O. J. Connell 3 Mosberger, E½ NE NE 28-9s-20e, Jefferson County, was completed as a gas well with a potential of 2,000,000 cu. ft. Bartlesville sand was at 1,310-32 ft., total depth.

Magnolia Petroleum Co. took over the Charles Miller 1 Jeannin, NE NW 7-10s-21e, Leavenworth County, Kansas, and swabbed 25 bbl. of oil from the Mississippi lime.

Illinois Fields

(Continued from Page 90)

4-3n-9e, pumped 322 bbl. oil and 316 bbl. water, perf. 2,595-99 ft., Weiler 2,598-2,625 ft., T.D. 2,650 ft.

Roland, White County: B. M. Heath 1 Hemphill-Porter, NW NE SE 12-7s-8e, dry at 2,615 ft., Kincaid 1,898 ft., Palestine 2,081 ft., Waltersburg sand 2,222 ft., Tar Springs sand 2,266 ft., Glen Dean 2,384 ft., Cypress sand 2,603 ft.

Rural Hill, Hamilton County: Shell 2 Cox, NE SE 12-6s-5e, pumped 44 bbl. oil and 1 bbl. water, shot 3,085-92 ft., Aux Vases sand 3,060 ft., pay 3,078-90 ft., T.D. 3,104 ft.

Stokes, White County: Pure-Carter 3 W. C. Goudy, NW NW NE 18-6s-9e, pumped 45 bbl., shot 2,789-2,810 ft., Paint Creek sand 2,792-2,807 ft., T.D. 2,810 ft.

Pure-Carter 2 Kisner Consol., NW SE SE 7-6s-9e, pumped 61 bbl., shot 2,817-32 ft., Paint Creek sand 2,809-32 ft., T.D. 2,832 ft.

South Bible Grove, Clay County: Pure 4 Zander, SE NE NE 17-5n-7e, pumped 119 bbl., Cypress sand 2,526-33 ft., T.D. 2,533 ft.

South Lawrence, Lawrence County: S. W. Mitchell 2 Bartholemy, S½ SW NE 26-2n-12w, dry at 1,438 ft.

W. R. White 3 S. Collins, SW SE NW 26-2n-12w, pumped 65 bbl., shot 1,325-47 ft., Biehl 1,325-47 ft., 1,354-71 ft., T.D. 1,372 ft.

Walpole, Hamilton County: Texas 2 S. L. Johns, NW NW SE 34-6s-6e, pumped 21 bbl., shot 3,147-52 ft., Aux Vases sand 3-141-45 ft., T.D. 3,153 ft.

Texas 5 McGill, SE NW SW 27-6s-6e, pumped 78 bbl., shot 3,081-3,101 ft., Aux Vases sand 3,071-91 ft., T.D. 3,101 ft.

Texas 4 M. Bond, SE SW NE 34-6s-6e, pumped 65 bbl., shot 3,114-27 ft., Aux Vases sand 3,101 ft., T.D. 3,136 ft.

West Inman, Gallatin County: Ivan Green 1 Grant, SE NE NW 15-8s-9e, pumped 17 bbl., shot 2,170-82 ft., Tar Springs sand 2,168-96 ft., T.D. 2,543 ft., P.B. 2,219 ft.

Miscellaneous, Wayne County: Larry Romine 1 Kinney, NE SE NE 16-1s-8e, pumped 22 bbl., shot 3,134-44 ft., Aux Vases sand 3,124 ft., T.D. 3,144 ft.

ROCKY MOUNTAIN AREA

Opening of Deeper Pay Zone Indicated in Elk Basin Field

DENVER, Colo. — Unofficial reports from the Elk Basin field in Wyoming state that the Ohio Oil Co. 4 Mack OPC-4 is flowing from the lower bench of the Tensleep horizon. If this is subsequently confirmed it will mean the opening of a deeper pay. The well is located ⅓ mile northwest of the Minelusa Oil Corp. discovery which flowed 80 bbl. an hour with the valve partially closed. The latter well produced only from the upper bend and did not drill into the lower sand. The Tensleep discovery already is recognized as the major development of the year in the Rocky Mountain area. Last official report on the Ohio well gave the total depth as 4,542 ft. with the 5½-in. cemented at 4,472 ft., below the upper bench which was reported to have consisted of nice saturated sand. Ohio is building rig for its 3 Mack OPC-7, NE NE NW 31-58-99, a west offset to Minnelusa's 2 Henderson, which in turn is a west offset to the discovery. The Stanolind Oil & Gas Co. 1 Dengler, 3 miles north and west of the discovery, has spudded and set the 13⅜-in. at 322 ft.

Mack Drilling Co., contractor for the Plant Defense Corp., has spudded in the first of four wells to be drilled in the Salt Valley area, Grand County, Utah, where an oil discovery was made last fall in a hole prospecting for potash and magnesium. The wells, which will be drilled from ½ to 1 mile or more out from the discovery, will explore the lateral extent of the deposits. The new well is in NE NE 16-22s-19e, more than 1 mile to the south. It is drilling in the Dakota at 1,540 ft.

The Ohio Oil Co. has started an exploratory well on the Middle Allen Lake high in Carbon County, Wyoming, in its 2 U. P.-Wister, NW SW NE 13-22n-79w. It is drilling at 1,014 ft. after cementing the 10⅞-in. at 195 ft. The location is 4 miles southeast of the Allen Lake gas field and 1¼ miles west and north of the nearest gas well in the East Allen Lake field.

The Kevin-Sunburst area in northern Montana is scheduled for a pronounced increase in drilling activity the coming spring due to the growing demand for crude. The Texas Co., which recently acquired the Ohio Oil Co. holdings, will be particularly active not only on its own and newly acquired acreage but in some semi-wildcat areas in and about the field. These will be mostly in areas drilled earlier in the development of the field and subsequently abandoned. Some of these old districts now make good producers under modern methods, especially since the introduction of acidization. This company's 10 Swears, in the old Baker-Howling pool, which had 700 ft. of oil in the hole, was acidized and reported a completion last week for 7 bbl. an hour on the pump. A later report credited it with 232 bbl. in 24 hours. Some wells in the field which had only small shows and were considered uncommercial under old methods now are made substantial producers.

Oil in storage in Montana fields at the end of January as reported by the state Oil Conservation Board was 635,052 bbl., a decrease of 774,412 bbl. as compared with the same date in 1942. The net decrease in January was only 3,087 bbl., Kevin-Sunburst being down 6,850 bbl. and Cut Bank up 24,634 bbl., the difference being credited to other fields. Exports to Canada dropped to 62,766 bbl. in January, a decrease of 27,477 bbl. as compared with December. Canadian refiners now are buying considerable crude in Wyoming to make up insufficiencies in Montana and these purchases will show up to a larger extent during the next few months. Production in all fields in January was 574,134 bbl., a decrease of 103,327 bbl. as compared with December.

Among the fields which are resuming development after the winter lull are Cole Creek and Frannie, both in Wyoming. General Petroleum has made a location for its first well for the season in 53 Government, NW SW NE 21-35n-77w, Cole Creek, and Kirk Oil Co. is building rig for its 5-M Government, SE SW SW 24-58n-98w, Frannie field.

MONTANA COMPLETIONS

Cut Bank, Glacier County: William Hanlon 1 Tribal-225, SE NE NW 25-32n-6w, T.D. 3,148 ft., 7-in. 3,010 ft., Sunburst dry at 3,075-80 ft., Cut Bank 3,000-40 ft., main pay 3,132-40 ft., 1,500 ft. oil in hole, preparing to swab.

Glacier Production Co. 5 Corrigeaux, C SE NW 21-33n-5w, T.D. 2,960 ft., 7-in. 2,927 ft., Cut Bank 2,915-59 ft., main pay 2,954-59 ft., swabbed 60 bbl. 16 hr.

NORTHWEST NEW MEXICO COMPLETIONS

Fulcher Basin, San Juan County: Southern Union Production Co. 1 fee, NW SE 2-29n-12w, T.D. 2,132 ft., 5½-in. 2,020 ft., 750,000 cu. ft. of gas.

Hospah, McKinley County: Petroleum Products Corp. 1 Osburn (well No. 32), NW SW 31-18n-8w, T.D. 1,720 ft., 7-in. 1,705 ft., top Hospah sand 1,708 ft., pumped 25 bbl. per day, 15 per cent water.

TEXAS GULF COAST

Fishing Job Delays Deep Test in Old Ocean Field

HOUSTON, Tex.—J. S. Abercrombie and Magnolia Petroleum Co. B-1 McDonald, in the Old Ocean field of Brazoria County, which since September 3, 1942, had been drilling its uneventful way toward a probable record as the deepest hole in the world, struck a snag at last when, at 14,378 ft., it lost several joints of drill pipe. It was engaged in a fishing job at the week end. It has only 205 ft. more to go to take second place among the world's deep well holes, now held by Continental Oil Co. in Washita County, Oklahoma. To gain first place it must pass the mark of 15,004 ft., recorded by a Continental test in Kern County, California.

Eyes were turning in the past week toward Liberty County, where two new wildcat tests were on their way, following a period of inactivity. Ohio Oil Co. was building road for 1 B. E. Quinn, in the D. Donahoe Survey, 4½ miles northeast of Cleveland, and Yequa Oil Corp. had staked location for 1 E. N. Boyt, in the C. Meche Survey, 6 miles southeast of Devers. It is planned to carry the 1 Quinn to the Wilcox sand at 10,500 ft., and the 1 Boyt to 7,500 ft.

Stanolind Oil & Gas Co. was getting some interesting results from tests of its 1 G. T. Pattison, 3½ miles north of the Katy gas field, in Waller County, a wildcat which is expected either to extend the Katy field or establish a new pool. At total depth of 8,000 ft., with perforations at 7,338-45 ft., it tested 6.17 bbl. of fluid in 2½ hours through ¾-in. choke, 89 per cent of it distillate and 11 per cent salt water. This was accompanied by gas at the rate of 3,250,000 cu. ft. a day. Tubing pressure was 2,425 lb., casing pressure 2,650 lb., and gas-oil ratio 62,000. The well was killed and the perforations were squeezed. The casing then was perforated at 7,116-21 ft., and 2-in. tubing was run at 7,097 ft. A test showed production of gas at the rate of 11,500,000 cu. ft. daily through ⅝-in. choke. Tubing pressure was 1,375 lb., casing pressure 2,745 lb., and gas-oil ratio 70,000. The well was killed, and preparations were begun for another squeeze job.

Humble Oil & Refining Co. 1 A. C. Isaacson, 3½ miles southeast of El Toro, in Jackson County, underwent a 28-minute drill-stem test on perforations at 4,598-4,604 ft., with packer set at 4,591 ft. It resulted in a slight blow and recovery of 800 ft. of water cushion, 1,170 ft. of gas-cut mud, and

1,650 ft. of salt water and sand. Preparations were being made to perforate at 5,450-53 ft.

Gray & Wolfe's discovery, 1 Grogan-Cochran Lumber Co., 3 miles south of Magnolia, in Montgomery County, was to have been officially completed last week, following the granting of permission to make a dual completion, but one of the three packers required broke. That necessitated killing the well and bringing it back onto production again before the final completion can be made.

Two new wildcat projects in this territory are Forrest Development Co. 1 John M. Bennett, R. Musquez Survey, Jackson County, and Shield Oil Co. 1 Henderson & Pickering, a Humble farmout, 5 miles northwest of La Salle, also Jackson County.

TEXAS GULF COAST COMPLETIONS

Wildcats

Brazos County: Phillips 1 Annie B. Renchie, William Devers Sur., dry at 7,776 ft.

Jackson County: W. Stewart Boyle et al 1 J. R. Budd et al, 1 mi. W of Cordelle, junked at 2,520 ft.

Jefferson County: Glenn H. McCarty, Inc., 1 J. T. Shelby, 3½ mi. SE of Nederland, dry at 10,017 ft.

San Jacinto County: Brewster-Bartle Drilling Co. 1 Lucy B. Modesett, 6½ mi. NE of Shepherd, dry at 4,051 ft. in sidetracked hole; T.D. original hole 8,263 ft.

Fields

Boling, Wharton County: Pan American Production Co. 1 E. Kellner, S. F. Austin Sur., A-2, dry at 3,771 ft.

Dickinson, Galveston County: Pure 2-A Sealy-Hutchins, P. G. Merritt Sur., A-155, O.W.W.O., old T.D. 8,118 ft., new P.B. T.D. 8,015 ft., 43 bbl. distillate and 3,227,000 cu. ft. gas through ¼-in. positive choke, perf. 7,966-8,006 ft., T. P. 1,490 lb.

Pure 3 Sam Levin, W. G. Banks Sur., A-36, O.W.W.O., old T.D. 8,119 ft., new P.B. T.D. 8,000 ft., 9 bbl. oil and 896,000 cu. ft. gas through 10/64 in. positive choke, perf. 7,975-95 ft., T.P. 1,500 lb.

Esperson, Liberty County: General Crude Oil Co. 2 City Investment Co., M. S. Hegegard Sur. A-658, 106 bbl. through ⅛-in. positive choke, T.P. 900 lb., S.I. C.P. 2,300 lb., gas-oil ratio 1,108, T.D. 8,952 ft., P. B. 8,599 ft.

Lovell's Lake, Jefferson County: Humble 5 B. A. Steinhagen, William Carr Sur., A-102, dry at 7,806 ft.

North La Ward, Jackson County: Cities Service Oil Co. 2 Chamrad Unit Jessie White Sur., A-82, 304 bbl. through $\frac{5}{16}$-in. choke, T.P. 420 lb., C.P. 640 lb., gas-oil ratio 236, perf. 5,225-29 ft. T.D. 5,242 ft.

West Mauritz, Jackson County: W. S. Boyle et al T. N. Mauritz et al, A. Kountze Sur., A-237, 115 bbl. through 7/64-in. choke, T.P. 575 lb., C.P. 875 lb., gas-oil ratio 400, perf. 5,494-5,500 ft., T.D. 5,712 ft

Southwest Texas

(Continued from Page 93)

choke, T.P. 50 lb., C.P. 890 lb., perf. 4,454-64 ft., T.D. 4,613 ft.

East, Jim Hogg County: 96 bbl. through 5/32-in. choke, T.P. 300 lb., C.P. 1,000 lb., gas-oil ratio 686, T.D. 4,736 ft.

North Sun, Starr County: Sun 1-A Arcadio Guerra, La Sal Colorado grant, dry at 5,702 ft.

South Campana, McMullen County: Transwestern Oil Co. 1 Kate Schoeler, B.S. &F. Sur. 103, A-137, 15,000,000 cu. ft. gas, S.I. T.P. 1,115 lb., S.I. C.P. 1,115 lb., T.D. 3,100 ft.

OKLAHOMA

East Watchorn Extension Revives Interest in Osage County

THE East Watchorn pool of Pawnee County was the scene of important developments during the past week. Continental Oil Co.'s first test flowed 539 bbl. of oil in 24 hours in Wilcox at 3,811-33 ft., on the same level as producing wells to the south of it. The well is in the SW SW NW 24-23n-3e, and is nearly a mile north extension to the field, carrying it across the Arkansas River and into Osage County.

With the successful completion of this test, the Osage Indian Agency at Pawhuska offered a total of 57 tracts for sale, of which only 21 were not sold. Phillips Petroleum Co. was the highest bidder for a single tract, paying $66,000 for the 160 acres in the SE 14-23n-3e, a northwest offset to the 160 acres on which Continental's well is located.

A new Misener sand pool was reported in Noble County. Atlantic Refining Co. 1 Boulden, SE SE SE 12-21n-2w, perforated casing at 5,054-64 ft., after finding the first Wilcox dry at 5,145 ft. and was said to be making from 100 to 150 bbl. of oil a day. Location is northwest of Perry and some 6 miles north of the Luciene pools.

A number of other wells were reported as extensions to proven areas. In the old Avoca area of Pottawatomie County, Mid-Continent 1 Rich, SE NE NE 1-6n-3e, pumped 186 bbl. of oil a day in Viola at 4,250-4,303 ft.; it is a 1-mile west extension. The well is just south of the St. Louis area. The Manahan Drilling Co. 1 Rich, E½ SE NE 1-6n-3e, south of the Mid-Continent well, had made location early last week.

A comparatively large flowing well was added to the southern tip of the Byars pool in McClain County, the first completion there in several months. Phillips Petroleum Co. 1 Hen, SE SE 21-5n-3e, flowed 158 bbl. of oil a day through 1/64-in. choke on tubing in the Viola lime at 3,461-93 ft.

Ace Gutowsky and D. D. Bourland 1 Wagner, an interesting wildcat in NW NW SW 32-14n-4w, 4 miles west of the Edmond pool in Oklahoma County, was drilling below 7,380 ft. late last week and looking for the Wilcox. It was in the Simpson zone topped at 7,363 ft. Shows of oil were found in the Bartlesville sand at 6,736-43 ft. and the Hunton lime at 6,877-7,235 ft. Pipe was to be set to test the lime section.

OKLAHOMA COMPLETIONS

Wildcats

Comanche County: Texas Co. 1 Cline, NW NE 8-3n-10w, 4,500,000 cu. ft. gas, sand 1,020-40 ft., T.D. 1,122 ft.

Hughes County: Bradley Bros. 1 Echels, SW SW SW 21-6n-8e, pumped 240 bbl., Booch, 2,636-58 ft., gravity 33.

Burke-Greis and Deep Rock 1 Strickland, NW NE NE 19-7n-10e, dry, T.D. 4,961 ft., 9,000,000 cu. ft. gas at 3,625-35 ft., Cromwell 3,818 ft., Misener 4,723 ft., Viola 4,790 ft.

Osage County: Bowers Oil No. 1, SW NE NW 18-23n-10e, dry, T.D. 2,690 ft., Mississippian chat 2,268 ft., Mississippi lime 2,275 ft., Woodford 2,563 ft., limestone 2,608 ft.

Pottawatomie County: Phillips 1 Rose, SW SW SW 2-8n-3e, dry, T.D. 5,362 ft., Hunton 4,856 ft., Viola 5,040 ft., dolomite 5,139 ft., Wilcox 5,196 ft., second Wilcox 5,335 ft.

Fields

Bebee, Pontotoc County, G. Witherspoon et al 1 Starritt, NW SE NE 29-5n-5e, dry, T.D. 2,603 ft., Hunton 2,260 ft.

Byars, McClain County: Phillips 1 Hen, SE SE 21-5n-3e, flowed 158 bbl., Viola 3,461-93 ft.

Avoca, west extension, Pottawatomie County: Mid-Continent 1 Rich, SE NE NE 1-6n-3e, pumped 186 bbl., Viola 4,250-4,303 ft.

West Cromwell, Seminole County: J. E. Hall 1 Harbor, SE NE 10-10n-7e, flowed 28 bbl., Cromwell 3,631-44 ft.

N.E. Edmond, Oklahoma County: Harper-Turner 1 Sherman, SW SE 8-14n-2w, flowed 35 bbl., Bartlesville 5,872-97 ft., gravity 46.

Harper-Turner 9 Harper, SW SE 17-14n-2w, old T.D. 5,900 ft., drilled to 6,386 ft., dry, second Wilcox 6,340 ft., recompletion.

Loco, Stephens County: A. Singer 1-A Watson, NE NW SW 6-3s-5w, dry, T.D. 1,215 ft.

Milroy, Stephens County: Texas 1 Harley, NW NW SE 24-2s-4w, dry, T.D. 2,974 ft.

N. Okemah, Okfuskee County: British-American 2-B Blass, SW NW SW 36-14n-9e, dry, T.D. 3,225 ft., Gilcrease 3,135 ft.

Oklahoma County, offset: Harper-Turner 2 Kuno, NE SW 33-14n-2w, dry, T.D. 6,030 ft., Hunton 5,945 ft.

E. Watchorn, Pawnee County: Continental No. 1, SW SW NW 24-23n-3e, flowed 539 bbl., Wilcox 3,811-33 ft.

Wewoka townsite, Seminole County: Ligon 1 Malone, NW NE SE 16-8n-8e, flowed 264 bbl., gravity 37, pay 3,230-42 ft., old T.D. 3,941 ft., P.B. 3,910 ft., recompletion.

Miscellaneous

Creek County: Creekmore-Rooney 1 Scruggs, SW SE 27-17n-8e, dry, T.D. 3,636 ft., Wilcox 3,606 ft.

Gulf 32 Clayton, SW NE SE 8-17n-12e, repressure well, T.D. 1,694 ft.

Gulf 34 T. Berryhill, SE SE 9-17n-12e, repressure well, T.D. 1,579 ft.

Osage County: Devonian Oil No. 2, N½ SW SE 34-22n-7e, pumped 5 bbl., sand 3,094-3,200 ft.

Peters Pet. No. 1, SW NW NW 28-23n-10e, dry in Arbuckle 2,599 ft., T.D.

Winona Oil No. 26, NE SW SE 28-24n-10e, pumped 1 bbl., Cleveland 1,370-91 ft.

Barnsdall No. 9, NE NW SW 30-24n-10e, pumped 20 bbl., Bartlesville 1,992-2,072 ft., T.D. 2,082 ft.

Granger Pool Extended Half Mile Northward

ZANESVILLE, Ohio.—The Wehrle Co. finished their Jas. Adrian well in the Clayton pool. It flowed at the rate of 280 bbl. per day. The Granger pool was extended ½ mile to the north by the completion of the Ohio Fuel's Minnie Simon well in Lot 79. The deep wildcat, drilling by the Sinclair Prairie on the Longsworth tract in Olive Township, Meigs County, is expected to reach the Trenton limestone this week.

OHIO COMPLETIONS

Athens County, Ames Township: Carpenter & Glazier 2 M. P. Eddy, Fr. 13, Cow Run, dry, T.D. 109 ft.

Carthage Township: Ohio Fuel 1 Aletha Chase, Fr. 7, Injun, dry, T.D. 1,208 ft.

Rome Township: Bode et al 1 David Welsh, Sec. 32, Keener, 400,000 cu. ft., T.D. 1,277 ft.

York Township: F. J. O'Mara 1 Alonzo Coakley, Sec. 30, Berea, 789,000 cu. ft., T.D. 832 ft.

Coshocton County, Clark Township: Ohio Fuel 1 H. W. Croskey, Lot 20, Clinton, 877,000 cu. ft., T.D. 3,317 ft.

Holmes County, Monroe Township: Ohio Fuel 1 B. B. Finney, Sec. 22, Clinton, dry, T.D. 3,340 ft.

Richland Township: Max Johnston 1 J. R. Weber, Sec. 14, Clinton, dry, T.D. 3,287 ft.

Lawrence County, Symmes Township: Ohio Fuel 4 D. A. Moulton, Sec. 30, Clinton, dry, T.D. 3,029 ft.

Medina County, Granger Township: Ohio Fuel 1 M. A. Simon, Lot 79, Clinton, 1,060,000 cu. ft., T.D. 3,497 ft.

Meigs County, Bedford Township: Ohio Fuel 1 Alfred Hawks, Sec. 5, Berea, dry, T.D. 1,752 ft.

Rutland Township: Ohio Fuel 2 Lelia Rumfield, Sec. 27, Maxon, dry, T.D. 751 ft. (Drilled deeper.)

Morgan County, York Township: Industrial Gas 2 Glenn C. Pletcher, Sec. 35, Berea, 119,000 cu. ft., T.D. 1,170 ft.

Noble County, Elk Township: Chas. Robinson 2 D. M. Parks, Sec. 29, Germantown, dry, T.D. 930 ft.

Enoch Township: Wm. Patton 8 Leo Gerst, Sec. 7, Berea, 45,454 cu. ft., T.D. 1,662 ft.

Marion Township: Ohio Fuel 1 Clifford Stephens, Sec. 30, Berea, dry, T.D. 1,491 ft.

Perry County, Clayton Township: Preston Oil 3 F. G. Rhoades, Sec. 7, Clinton, 12 bbl., T.D. 3,273 ft.

Wehrle Co. 1 Jas. Adrian, Sec. 4, Clinton, 280 bbl., T.D. 3,380 ft.

Madison Township: Ohio Fuel 1 John Gorski, Sec. 15, Clinton, 1,780,000 cu. ft., T.D. 3,331 ft.

Stark County, Pike Township: Belden et al 4 O. C. Barber, Sec. 10, Clinton, 1,600,000 cu. ft., T.D. 4,890 ft.

Summit County, Tallmadge Township: Pawnee O. & G. 2 Henry Harris, Lot 4, Clinton, 115,000 cu. ft., T.D. 4,052 ft.

Wayne County, Plain Township: Ohio Fuel 1 M. D. Overholt, Sec. 24, Clinton, 73,000 cu. ft., T.D. 2,956 ft.

INDIANA

EVANSVILLE, Ind.—Paul Rossi has abandoned the 1 Kincheloe Williams, NE NE NW 35-5s-13w, about 1½ miles west of Springfield, Ind., as dry at a total depth of 2,967 ft. through the McClosky lime. The Carter Oil Co. is drilling at about 2,250 ft. on the 1 Katheryn Schneider, SW SW 34-7s-14w, 2 miles southwest of Hovey. The Waltersburg sand, encountered at 1,937-48 ft., had no show of oil and the Tar Springs sand, topped at 2,030 ft., had no signs of commercial saturation.

The Bristol Hackbush 1 H. H. Schweikhand, NW NE SW 23-5s-12w, 5 miles northwest of Evansville, is reported shut down at 350 ft. for repairs to the drilling rig.

INDIANA COMPLETIONS

Gibson County: Superior 1 P. Brazelton et al, NW SW SE 24-2s-12w, dry at 2,370 ft., Menard 1,477 ft., Waltersburg sand 1,576 ft., Tar Springs sand 1,637 ft., Glen Dean 1,746 ft., Cypress sand 1,969 ft., Aux Vases 2,205 ft., Ste. Genevieve 2,233 ft., McClosky 2,279 ft.

L.L. Travis 1 C. O'Neal, NE NW SW 35-2s-9w, pumped 33 bbl., natural, Mansfield pay 1,064-81 ft., T.D. 2,266 ft., P.B. 1,083 ft., pool opener.

R. D. Brown, Inc. 3 fee, SW NW NW 36-1s-10w, pumped 150 bbl., natural, Hardinsburg sand 1,386-1,400 ft., 1,405-25 ft., T.D. 1,425 ft.

Posey County: Trans-Tex 1 Mumford, NW SE NW 33-3s-13w, pumped 20 bbl. oil and 12 bbl. water, shot 2,452-60 ft., Cypress sand 2,420-24 ft., 2,427-36 ft., 2,450-60 ft., T.D. 2,464 ft.

Randolph County: John Seip 1 R. Frazee, SW SE 28-21n-14e, pumped 1½ bbl., Trenton 1,018 ft., T.D. 1,092 ft., pool opener.

EASTERN KENTUCKY

ASHLAND, Ky.—One oil well was reported completed in eastern Kentucky this week while drilling activities continued to level off on the same trend as displayed in the past 2 weeks. Four gas wells, including one million-plus, were included in the completion reports.

Diederich et al are reported to have completed a well on the Cassidy farm in Martin County, which was termed a good gas well, but production data was not available.

EASTERN KENTUCKY COMPLETIONS

Johnson County: Kentucky-West Virginia 707 Eddie Hitchcock land on Jenny Creek, flowed 133,000 cu. ft. at 2,429 ft. in Big Six.

Knott County: Kentucky-West Virginia 5429 Jefferson Hall land on Right Beaver Creek, flowed 103,000 cu. ft., T.D. 3,171 ft. in shale.

Kentucky-West Virginia 13 Clay Martin tract on Jones Fork, flowed 84,000 cu. ft. gas in shale and 47,000 cu. ft. in Big lime, T.D. 2,447 ft., recompletion.

Martin County: Kentucky-West Virginia 5442 Dave Cornett land on Coldwater Fork, flowed 1,107,000 cu. ft., T.D. 1,186 ft. in Maxon.

Virginian Gasoline & Oil Co. 2 A. L. Moore land, estimated production 8 bbl. of oil a day, T.D. 1,606 ft.

California

(Continued from Page 94)

cent cut, T.D. 4,619 ft., perf. 4,154-4,614 ft., completed beneath Huntington Beach tidelands in Miocene formation by directional drilling.

Montebello, Los Angeles County: Standard Oil Co. 98 Baldwin, 1-2s-1w, pumped 75 bbl. net, 17.8-gravity, 80 per cent cut, T.D. 3,115 ft., perf. 2,643-3,113 ft., well has been on production test for several weeks in attempt to exhaust water production, completed in Baldwin zone of Pliocene age.

Standard Oil Co. 102 Baldwin, 36-1s-12w, pumped 210 bbl. net, 18.2-gravity, 12 per cent cut, T.D. 2,710 ft., P.B. 2,660 ft., perf. 2,241-2,658 ft., completed in Baldwin zone of Pliocene age.

Stanton wildcat district, Orange County: J.E.F. Oil Co. 1 Larson, 23-4s-11w, abandoned in gray sand, T.D. 3,200 ft., no important showings of oil or gas logged.

Wilmington, Los Angeles County: Long Beach Oil Development Co. 51-W Harbor, 10-5s-13w, pumped 220 bbl., 17.5-gravity, 0.2 per cent cut, T.D. 3,457 ft., gravel-packed perf. 3,140-3,452 ft., completed in Ranger zone of Pliocene age.

Yorba Linda, Orange County: Shell Oil Co. 56-16 Olinda fee 4, 16-3s-9w, pumped 286 bbl., 18.6-gravity, 0.7 per cent cut, T.D. 2,352 ft., perf. 2,082-2,107 ft., 2,137-2,202 ft., 2,267-95 ft., 2,315-47 ft., completed in Olinda zone of Miocene age.

Cat Canyon Well Makes Pumper

In the Cat Canyon district of Santa Barbara County, Standard made a pumping test on 1 South Basin-Lloyd in 15-9n-33w at 7,250 ft. and while the well pumped 90 bbl., the output showed a cut of 30 per cent and an effort will be made to effect a more satisfactory shutoff. In the Zaca Creek district southeast of the Gato Ridge field in Santa Barbara County, Tide Water Associated Oil Co. has resumed drilling operations in 1 Chamberlain which indicated a daily potential of about 250 bbl. of heavy low-gravity crude from a shale body at 4,430 ft. The oil found in this well as well as in 1 Davis drilled previously is so heavy that it is necessary to inject distillate in order to reduce the viscosity sufficiently to permit pumping.

COASTAL DISTRICT COMPLETIONS

Newhall Potrero, Los Angeles County: Barnsdall Oil Co. 34 Rancho San Francisco, 35-4n-17w, flowed 240 bbl., 30.5-gravity, 2 per cent cut, 427,000 cu. ft. gas, 15/64-in. bean, pressures 450/1,180 lb., T.D. 7,627 ft., perf. 7,258-98 ft., 7,378-7,622 ft., completed in third Modelo.

Santa Maria Valley, Santa Barbara County: Union Oil Co. 2-5 Bradley Lands, 36-10n-34w, pumped 340 bbl., 14.5-gravity, 1 per cent cut, T.D. 5,085 ft., perf. 4,662-5,063 ft., completed in Santa Maria Valley zone of Miocene age.

Shiells Canyon, Ventura County: Security Exploration Co. 2 Bardsdale, 3-3n-19w, abandoned in gray sand and shale, T.D. 1,428 ft., no important showings logged.

Ventura Avenue, Ventura County: Shell Oil Co. 159 Taylor, 30-3n-23w, flowed on gas lift 230 bbl., 31-gravity, 20 per cent cut, T.D. 9,936 ft., perf. 8,950-9,313 ft., 9,568-9,848 ft., 9,890-9,931 ft., completed in lower Lloyd zone.

Well Completions Show Further Decline in February

A CONTINUED decline in completions was reported during February, the total being 91 per cent of that of January and 76 per cent of that of December 1942. The number of drilling wells has also dropped 6 per cent from last month so that no immediate upturn appears likely. The greatest decline is in dry holes which are down 16 per cent from January and 24 per cent from December, indicating a severe decline in wildcatting. Part of this decline is seasonal as cold and wet weather slows up wildcat operations, particularly in the north but all of the drop cannot be attributed to the weather. The fact that oil well completions are down 7 per cent from January and 22 per cent from December indicates a lack of locations to drill in newly discovered and undeveloped fields. The downward trend to a level well below the PAW estimate of 1943 drilling and in the face of increased demands for oil and a possible shortage reflects the need for some stimulation to drilling and also the discovery of some place in which to drill.

SUMMARY OF OPERATIONS, FEBRUARY 1943

	Comp.	Oil	Prod.	Gas	Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Drlg.
Appalachian	198	151	318	42	5	0	178	14	6	0	423,516	171
Ohio	53	7	334	29	17	6	15	31	1	0	148,914	172
Indiana	24	10	715	1	13	4	13	7	0	0	46,002	42
Kentucky	27	12	2,700	8	7	0	12	15	0	0	57,111	102
Michigan	29	12	600	0	17	0	11	16	2	0	83,178	74
Illinois	143	103	12,061	2	38	4	64	75	0	0	359,040	226
Kansas	102	48	23,454	3	51	0	13	89	0	0	335,616	199
Nebraska	0	0	0	0	0	0	0	0	0	0	0	12
Missouri, Iowa	2	0	0	0	2	2	0	0	0	0	694	5
Oklahoma	81	34	4,447	10	37	3	33	37	8	0	242,227	189
North Texas	53	23	3,949	0	29	5	28	12	7	0	133,784	89
West Central Texas	25	8	2,900	3	14	4	14	7	0	0	55,112	55
West Texas	72	59	31,983	1	12	0	19	27	26	0	302,627	165
Texas Panhandle	23	11	1,597	11	1	0	2	21	0	0	72,355	38
East Texas	19	10	4,333	2	7	0	0	8	11	0	113,888	8
Upper Gulf Coast	27	13	2,212	4	10	1	1	1	22	2	169,668	61
Lower Gulf Coast	32	14	1,492	3	15	0	2	11	18	1	198,466	56
South Central Texas	6	1	80	0	5	0	3	3	0	0	17,052	12
South Texas	23	6	670	1	16	0	3	15	4	1	93,284	59
Southeast New Mexico	12	11	1,276	0	1	0	1	10	0	0	32,040	41
Arkansas	19	11	1,206	0	8	0	2	8	9	0	94,479	30
North Louisiana	24	11	1,743	1	12	0	6	7	11	0	99,096	33
Louisiana Gulf	19	9	1,558	1	9	1	1	0	8	9	161,181	80
Mississippi	3	0	0	0	3	0	0	2	1	0	14,477	19
Montana	8	5	605	1	2	0	4	4	0	0	18,369	62
Wyoming	7	6	875	0	1	2	0	4	1	0	20,544	60
Colorado, Utah	1	0	0	0	1	0	1	0	0	0	1,350	29
Northwest New Mexico	0	0	0	0	0	0	0	0	0	0	0	17
California	79	63	9,484	0	16	2	34	31	9	3	256,483	108
Florida	0	0	0	0	0	0	0	0	0	0	0	3
Total February	1,110	638	107,919	123	349	34	461	455	144	16	3,550,553	2,217
Total January	1,221	687	110,565	117	417	48	449	512	197	15	3,970,864	2,354
Difference	111	49	2,646	6	68	14	12	57	53	1	420,311	137

NORTH LOUISIANA

South Arkansas Wildcat Reported Dry

SHREVEPORT, La.—No developments other than routine drilling was reported from the North Louisiana-Arkansas area. In Lafayette County, W. G. Ray Drilling Co. 1 Warnock-Lecroy was dry at 6,326 ft. This well was of considerable interest to operators as it is about 2½ miles north and east of the new North Carterville pool across the border in Louisiana. Location was SW SW 3-20s-24w, southeast of Bradley, Lafayette County, Arkansas.

ARKANSAS COMPLETIONS

Wildcats

Bradley County: Placid Oil 2 Southern Lumber Co., NW SW 12-16s-10w, dry, T.D. 5,390 ft.

Columbia County: Hunt Oil 1-A Pine Woods, SE NW 9-20s-22w, dry, T.D. 6,315 ft.

Fields

New London, Union County: Marine Oil 1 Pagan, SW SW NW 18-18s-11w, flowed 123 bbl., Cotton Valley 5,681-97 ft., T.D. 5,833 ft.

Stephens, Columbia County: McAlester Fuel Co. 1 Longino, NW NE 10-15s-20w, dry, T.D. 4,025 ft.

G. H. Vaughn, Jr., 1 F. S. Green, NE SW 11-15s-20w, 137 bbl., Tokio sand 2,470-75 ft., T.D. 3,424 ft.

NORTH LOUISIANA COMPLETIONS

Haynesville, Claiborne Parish: Midstates Oil 1 Crump, approx. SW SE 12-23n-8w, flowed 58 bbl., Pettit 5,288-5,306 ft., T.D. 5,380 ft.

Hosston, Caddo Parish: Bayou State Oil 1 Kelly, SW SE SW 24-22n-15w, 10 bbl., Nacatoch 1,050 ft., T.D.

Pine Island, Caddo Parish: Southern Oil & Gas 8 Muslow, SE SE NW 5-20n-15w, 35 bbl., chalk, T.D. 1,525 ft.

Sligo, Bossier Parish: Triangle Drlg. 2-A Jeter, E½ NE SW 24-17n-12w, 35 bbl., pay 3,168-72 ft., T.D. 3,181 ft.

Canadian Fields

(Continued from Page 100)

ment, is increased from 15 to 25 per cent; and a special wartime depletion allowance of 33⅓ per cent replaces the present 20 per cent in respect to royalty payments. Exploration and drilling companies are allowed to accumulate costs incurred between January 1, 1943, and March 31, 1945, to write off against any producing well they may bring in; and exploration costs including geological and geophysical expenses and all off-property expenses of dry wells spudded in during this period shall be allowed against current income of companies whose principal business is the production, refining and marketing of petroleum to the extent of 40 per cent of the expenditures involved.

Gaspe Drilling

In the Gaspe Peninsula of Quebec, agreements have been reached between Continental Petroleums, Imperiol Oil and Wilfrid Robert McMaster, drilling contractor, for the drilling of two wells on the 85,000-acre property of Continental. C.P.L. 1, located on the Galt Brook dome, will be drilled with Imperial Oil equipment and machinery leased to Continental. Equipment is now at Gaspe village, the location has been cleared, road and bridge completed, and office and cook and bunk houses erected. This test will be carried to 8,000 ft. C.P.L. 2 has been located in the immediate vicinity of the old Petroleum Oil Trust 20, which has been flowing high-gravity crude for the past 46 years. This test will be carried to 2,500 ft.

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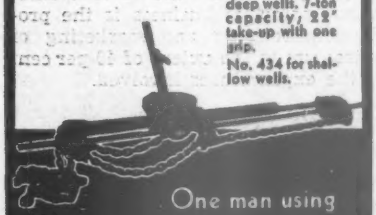

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Among the

Drilling Contractors

Houston Drilling Corp., Houston, Tex., was at completion depth this week at 2-A Ratliff, for Salt Dome Oil Co., in the Mayo field of Jackson County, Texas.

Patrick-Tyrrell Drilling Co., Houston, Tex., is drilling a wildcat for C. L. Wickliffe 12 miles north of Tyler, in Smith County, Texas. The well, 1 Andrew Hackett, is to go to 9,700 ft., according to plans. Nearest production is in the Hawkins pool, Wood County.

J. A. Gray, Houston, Tex., has contract to drill a well for Louis Crouch, on the Rodesseny lease, near production in the Ganado field, Jackson County, Texas.

Brewster-Bartle Drilling Co., Houston, Tex., encountered trouble in 1 Lucy B. Modesett, a wildcat which it is drilling for its own account 6½ miles northeast of Shepherd, San Jacinto County, Texas, and at 8,263 ft. in shale was fishing for seven joints of drill stem, drill collar and bit. The test, in the William G. Logan Survey, was projected to go to 8,500 ft.

Petroleum Well Service Co., Houston, Tex., has finished a dry hole at 6,020 ft. for James A. Gray, the 1 Foster Lumber Co., near Fostoria, Montgomery County, Texas, an Atlantic Refining Co. farmout.

Wynn Crosby Drilling Co., Houston, Tex., has staked location for a wildcat test on its own account 2½ miles east of the Fitzsimmons pool, in Duval County, Texas. It is planned to carry the well, 1 Garcia, to 5,000 ft. unless pay is encountered before reaching that depth. The contractor was at 4,960 ft. as the week closed at 1 W. M. Anders, a wildcat venture 9 miles west of Mansfield, in De Soto Parish, Louisiana. This well, projected to go to 6,300 ft., is also for Crosby's own account.

Jack W. Frazier, Houston, Tex., had rigged up and was waiting on fuel at the week end, preparatory to drilling 2 McCrory, in the Ganado area of Jackson County, Texas. Mr. Frazier has an interest in the well, along with D. M. Wallace and Walter Van Norman. The Frazier 1 Sweet Lake Oil & Land Co., in Cameron Parish, Louisiana, was abandoned in sidetracked hole at 8,954 ft.

H. Hess, Mount Vernon, Ill., has the contract to drill Jacob Vetsch 1 Mary Lange, SE NW 24-2s-6w, Saint Clair County, Illinois. The contract calls for drilling to the Trenton at about 2,700 ft.

Beacon Drilling Co., Tulsa, has contract for a 6,300-ft. wildcat test in Parker County, Texas, Devonian Oil Co.'s 1 Raymond Buck, 9 miles southeast of Weatherford and 16 miles southwest of Fort Worth. It will be a rotary test.

Carper Drilling Co., Artesia, N. M., has just finished a dry hole for its own account in the East Lusk pool of Lea County, New Mexico. The test was a failure at 2,682 ft.

Loffland Brothers, Fort Worth, Tex., and Tulsa, have moved in rig on a deep Ordovician wildcat for the Humble Oil & Refining Co. at 1 Sawyer Cattle Co., Section 13, Block 1, T.&P. Ry. Survey, Reagan County, Texas.

E. A. Harter has the contract on the Peterson Petroleum 1 Wilkinson, a wildcat in SE SE 11-12n-10w, Red River Parish, Louisiana, to test the Rodessa zone pay.

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Fred Postelle, Odessa, Tex., has finished contract on Ohio Oil Co. 1 Clark, southeast Sterling County, Texas, wildcat, which is bottomed at 8,486 ft.

Helmerich & Payne, Tulsa, last week set pipe through caving shale on Hunt & Turner 1 McMillan, a wildcat in Otero County, New Mexico.

W. B. Omohundro, Wichita Falls, Tex., is drilling at 3,200 ft. in Continental Oil Co. 1 Stephens, Clay County, Texas, wildcat 2 miles north of Buffalo Springs, Tex.

Lloyd Reed of Cambridge, Ohio, has contracted to drill three wells for the Trenton Gas Co. on a 3,500-acre block of leases at Oak Hill in Jackson County, Ohio.

Falcon-Seaboard Drilling Co. was moving in rotary tools late last week for its 1 Morris, in C W½ SE SE 35-16s-3w, 3 miles northeast of the Lindsborg pool of McPherson County, Kansas. The test is a semiwildcat.

Crow Drilling Co. will drill Northern Ordnance, Inc., 1 Mary Burr, in C SE SW 35-8s-9w, Mitchell County, Kansas, 40 miles northeast of Bunker Hill pool of Russell County.

Mercury Drilling Co., Tulsa, will drill Northern Ordnance, Inc., 1 Jenonsius, in C SE SE 24-2s-20w, Phillips County, Kansas, 4 miles west of Dayton pool. The test is a semiwildcat.

Holm Drilling Co. is the contractor on Northern Ordnance, Inc., 1 Roland heirs, C SE NE 27-3s-17w, Phillips County, Kansas. Location is 20 miles northeast of Ray Northeast pool. The test is a wildcat.

Parker Drilling Co. has been awarded the contract on Northern Ordnance, Inc., 1 Warner, C SE NE 10-15s-3w, Saline County, Kansas, 12 miles northeast of Lindsborg pool of McPherson County.

J. B. Daniel, Fairfield, Tex., has contracted with Byrd-Frost, Inc., to drill a wildcat west of Tucker, in southwest Anderson County, Texas, to a depth of 5,300 ft. Mr. Daniel has drilled many wells in Freestone and Anderson counties for his own account.

Moran Brothers Drilling Co., Wichita Falls, Tex., reached 3,500 ft. on a company test in the Browning field of Archer County, Texas, known as 1 Jentsch.

Big Chief Drilling Co., Oklahoma City, Okla., is making hole at an unreported depth on a tight wildcat being drilled for Youngblood & Foree of Dallas in southwest Wise County, Texas.

Rogers Brothers Drilling Co., Oklahoma City, Okla., missed twice last week in Montague County, Texas, getting two failures, one in the Davenport pool which hit granite at 3,514 ft., and another in the Rogers and Rogers pool which stopped at 5,315 ft.

J. W. Harris Drilling Co., Wichita Falls, Tex., is drilling on Anderson-Prichard and Darby Petroleum Co. 1 Mooney, southern Young County, Texas, wildcat which has reported shows in Strawn and Caddo formations, but which is scheduled to test the Mississippi lime. Casing was set at 4,310 ft.

Frank Wood, drilling contractor of Wichita Falls, Tex., has been awarded contract to drill a wildcat in Castro County, Texas, for Devore & Slade. A large rotary rig now in Cochran County will be moved on to the location. Contract depth of the test is 5,500 ft. Location is C NE Section 10, Block 9-T, T.&N.O. Survey on the Dinwiddle land close to the Swisher County line.

Robert W. Atha, Mount Pleasant, Mich., has received contract for three Gulf Refining Co. wells on the Blanche, Goulet and Siegrist farms in Sections 28 and 33-15n-4e, Kawkawlin Township, Bay County, Michigan.

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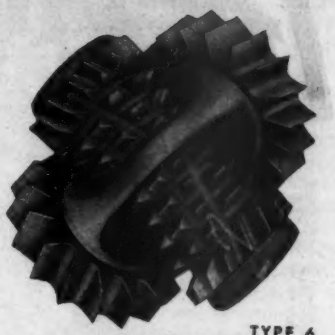

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PERSONALS

E. W. CLARK

Shell's New Kansas Division Chief Has Wide Experience

E. W. CLARK has recently been appointed manager of the Kansas division, production department, Shell Oil Co., Inc., which is currently the fourth largest producer of crude oil in Kansas.

Dr. Clark, a native of Bedford, England, graduated in 1925 from the Royal School of Mines of the University of London. After a short period of exploration work in the Maracaibo basin of Venezuela, he returned to London for two years to carry out a petroleum research project for the British Government. Subsequent to the completion of this work in 1927, Dr. Clark became associated with Shell and worked for Astra-Romana at Moreni, Rumania. He was transferred in 1928 to Tampico, Mexico, as exploitation engineer for the Corona and Mexican Eagle (El Aguila) companies. The following 2 years he was actively connected with these companies' deep exploration drilling campaign south of the so-called "Golden Lane," a campaign which eventually resulted in the discovery of the famous Poza Rica field, still the largest and most important source of oil in Mexico.

In 1930, Dr. Clark was transferred to the central offices of the production department of the Shell Group, at The Hague, Holland. Later he was assigned to special engineering and geological investigations for the Caribbean Petroleum Co., in Venezuela—particularly in connection with the development of the Mene Grande and Colon fields. This assignment was completed in 1932 and he returned to Mexico as exploitation engineer for the Tampico area—embracing the Panuco district, southern fields, and the new field of Poza Rica—where drilling development of the deep Tamabra pay proceeded during the following 5 years and new techniques were developed for the separation and metering of the oil and gas production of this extensive field.

In 1935, Dr. Clark was appointed chief exploitation engineer for El Aguila, in Mexico City, which post he held until the expropriation of the petroleum industry by the Mexican Government in 1938. Later in that year he transferred to Shell Oil Co., Inc., at Tulsa. He was engaged in special subsurface work in Oklahoma until early in 1942, when he became manager of the Oklahoma division of the production department.

R. P. May, formerly with Standard Oil interests in Venezuela and more recently in the foreign sales division of W-K-M Co., Inc., with headquarters at Port of Spain, Trinidad, has been appointed an administrative assistant of petroleum facilities in the Defense Supplies Corp., and will divide his time between Washington, D. C., and field headquarters in Brazil.

W. J. Lockard has been promoted to foreman at Shell's Wilmington, Calif., refinery.

Ross McCollum, president; **U. C. Murcell** and **J. W. Schmid,** vice presidents of National Oil Co., were reelected to their respective positions at the annual meeting of the company held in Los Angeles, Calif., this week.

Hugh A. Matier of Union Oil Co. was the speaker at the March monthly meeting of the Southern California section, A.I.M.E., and discussed the Alcan Highway over which he recently traveled.

Bob Field has returned to Amarillo, Tex., following a year spent in and around Detroit, Mich., where he was sent by Panhandle Eastern Pipe Line Co. He has charge of the Amarillo office and the land department of Panhandle Eastern.

W. Morris Guthrey has been promoted from assistant division geologist at Wichita, Kans., for the Texas Co. to division geologist. He succeeds **S. E. Mettner,** who resigned to join the geological staff of Transwestern Oil Co.

CHARLES E. SHAW

Charles E. Shaw has been named manager of the industrial relations department of the Standard Oil Co. (New Jersey), succeeding **F. W. Pierce,** recently named a director of that company. Mr. Shaw joined the Standard Oil Co. (New Jersey) 23 years ago following his graduation from Columbia University. After completing the company's training course he was assigned to the employment office at Bayway, N. J., and 3 years later became assistant head of industrial relations there. In 1924 he was named head of industrial relations at Bayway. Five years later he moved to Texas to head up the industrial relations department of the Humble Oil & Refining Co. and in 1934 he returned to New York to become assistant to Mr. Pierce, assistant to the president supervising industrial relations. In recent years he has spent much time in South America consulting with subsidiary companies in their industrial relations programs.

Fred Hall, of Panhandle Producing Co., has been spending some time in Amarillo, Tex., getting his company started on a development program of the properties owned by Clay Brothers.

Ross R. McCarty, district superintendent for Humble Oil & Refining Co. in the Chalkley district, Cameron Parish, Louisiana, has been transferred to the Avery Island district, Iberia Parish, Louisiana. **Byron R. Gossett,** assistant superintendent in the Lovell Lake district, Jefferson County, Texas, has been promoted to superintendent at Chalkley to succeed Mr. McCarty. **Neal B. Robins,** district chief clerk at Darrow, Ascension Parish, Louisiana, has been transferred to Avery Island. He is succeeded by **Morris W. Witte,** promoted from assistant district chief clerk at Paradis, St. Charles Parish. **Mark B. Donnell,** district chief clerk at Kel-

sey, Brooks County, Texas, has been transferred to the Imogene district, Atascosa County, Texas. He is succeeded by **Leon B. Barber**, chief clerk in the Chalk district. **Harold S. Shaffer** was transferred from the Raccoon Bend, Austin County, district to the Chalkley district as chief clerk.

Lt. Comdr. Age Skiolvig, of New York, has been granted leave as manager of products manufacture by Shell Oil Co., Inc., to accept active-duty assignment with the Navy. He had been manager of products manufacture since September 1940, when the St. Louis and New York offices were consolidated. He served 16 years at the Martinez refinery and San Francisco, Calif., offices of Shell before going to New York in 1938 as manager of the technological department of Shell Union Oil Corp.

Richard K. Rowell, who began his oil career as a still cleaner for Standard Oil Co. of California, has been appointed manager of Standard's El Segundo refinery, succeeding the late H. C. Hanna.

Horace W. Hindry, who has been division foreman in the coastal district for Shell Oil Co., has been promoted to engineer and transferred to the Los Angeles office for duty in the field department.

Jasper C. Dennis has been named chief engineer of the Tide Water and Seaboard cycling operations in the Cayuga and Long Lake fields, Anderson County, Texas. Prior to his recent promotion he was assistant to **William M. Vaughan**, who was transferred to Houston, Tex., and given supervision over gas operations of the Tide Water and Seaboard partnership operations in coastal Texas and Louisiana.

A. E. (Bert) Warner, was honored at a dinner in Midland, Tex., last week which closed the session of the foremen's meeting of the West Texas-New Mexico district of the producing department of Texas Co. An engraved wrist watch was given Mr. Warner by the company in recognition of 30 years of service. The presentation was made by **M. J. Adams**, assistant division manager for West Texas.

G. K. Schooler, district manager for Ohio Fuel Gas Co., at Findlay, Ohio, will become manager of the company's operations at Mansfield, Ohio, April 1, succeeding **William C. Mead**, who is retiring because of ill health. Mr. Mead underwent an eye operation recently and has been unable to return to his office. He is chairman of the Mansfield Naval Procurement Committee.

Frank Jones, Shell Pipe Line Corp., has been promoted to supervisor of materials at the company's head office in Houston, Tex. Previously, he was material man for the West Texas area at Colorado City.

Bruce M. Baird, foreman of the Phillips Petroleum Co.'s catalyst manufacturing plant was recently made foreman of the company's Capok plant at Oklahoma City, Okla., in addition to his other duties.

C. F. Wilson, administrator of salvage and scrap for the Lone Star Gas Co., Dallas, Tex., has received special commendation from **H. M. McDougal**, chief of the public utility division, industrial salvage branch, War Production Board. The company, under Mr. Wilson's supervision, salvaged nearly 3.5 million pounds of scrap.

G. S. Walden, former chairman of Standard-Vacuum Oil Co., and **A. H. Tomlinson**, a former director of the same company, are now attached to the American Embassy in London.

Ray Grange, assistant head stillman in the cracking department at Shell Oil Co., Inc.'s Houston, Tex., refinery, recently completed 20 years of service with the company.

D. C. Paulsen, formerly forman of repair and office operations of the Cabot companies at Schaefer, Tex., has been transferred to Guymon, Okla., where he is foreman for Cabot Shops, Inc., which is building a "soft black" plant in the Oklahoma Panhandle. **I. W. Brown** succeeds Mr. Paulsen at Schaefer.

L. Andrew, who started service as a construction foreman for the General Construction Co. in 1912 during construction of General Petroleum Corp.'s old Vernon refinery and now southern division superintendent of the pipe line and gathering system, recently completed 30 years' service with the company.

Ross, McCollum, U. C. Murcell, J. W. Schmid, John H. Suter, Walton Young, M. D. Schatzman and **S. J. Bell** were all reelected directors of the National Oil Co. at the company's recent annual meeting.

C. R. Coneway, petroleum engineer of Humble Oil & Refining Co., Houston, Tex., and **A. B. Penny**, advertising manager, gave a motion picture, "Trouble Lurks Below," with explanatory talk, before the Lions Club, in Corpus Christi, Tex., last week. The

THEY'VE GONE TO WAR

BUT THEY'LL BE BACK

BETTER THAN EVER

ENSIGN'S modern manufacturing facilities and more than 30 years of experience in producing efficient carburetion equipment are now all-out for Victory. Day and night, we are devoting practically our entire resources to help win the war.

But, although unable to provide our usual prompt service due to the war's demands, ENSIGN Carburetion Equipment is still available, and quick delivery of emergency parts is being maintained.

Now, as in the past, ENSIGN Carburetors for Natural Gas, Butane-Propane and Gasoline still lead the field for internal combustion engines of all types and sizes.

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Prepare, NOW, for post-war demands. Our competent engineering staff is at your service.

picture is that of a burning wild well, Humble's State B-6, in Corpus Christi Bay. Mr. Coneway described the process of extinguishing the fire by drilling a direction hole 8,600 ft. to the bottom of the burning well and pumping first water, then mud, at high pressure.

Frank Farley, president of W. F. W. Oil Co., Fort Worth, Tex., has just returned from a cold business trip to the fields of Michigan, which he believes are due for much further exploration due to shortages of fuel in the East.

Shifts: **Earl W. Jones,** engineer, Gulf Oil Corp., Goldsmith to Penwell, Tex.; **R. S. Crockett,** superintendent, Neches Butane Products Co., New York City to Port Neches, Tex.; **Edward V. Lane,** Bechtel-Price-Callahan, Los Angeles to San Francisco, Calif.; **Nicholas Lanyi,** engineer, Magnolia Petroleum Co., Edna to Dallas, Tex.; **Richard J. Lee,** engineer, Humble Oil & Refining Co., Corpus Christi to Midland, Tex.; **Dwight J. Evans,** engineer, Phillips Petroleum Co., Amherst, Tex., to Bartlesville, Okla.; **Fred B. Graham,** superintendent, Carter Oil Co., Eldorado to Carmi, Ill.; **T. J. O'Donnell,** engineer, Gulf Research & Development Co., Laurel, Miss., to Pittsburgh, Pa.; **M. D. Apelgain,** engineer, War Emergency Pipelines, Norris City, Ill., to Harper, Tex.; **W. H. Vaughan,** engineer, Tire Water Associated Oil Co., Palestine to Houston, Tex.; **Arch Williams,** superintendent, Selby Oil & Gas Co., Gladewater, Tex., to Tulsa; **A. G. Eberts,** engineer, Texas Co., Mount Pleasant to Tyler, Tex.

R. C. Davis, new president of the California Stripper Well Association, and **R. B. Mitchell,** former Gulf Coast

R. C. DAVIS

R. B. MITCHELL

division geologist for Stanolind Oil & Gas Co., and now with the consulting engineering firm of Foran-Boatright & Dixon, Houston, Tex., whose pictures were inadvertently transposed on page 105, March 11.

John Galloway, vice president of Standard Oil Co. of British Columbia, who has had charge of the company's exploratory and drilling work in Alberta, has resigned to become executive vice president of the newly organized Dominion Oil Co. which will take over and continue the Alberta operations. **L. N. Hamilton,** president of both companies, who formerly represented Standard of California in London, England, is taking leave of absence to represent the same company at Washington, D. C. Directors of the Dominion Oil Co. will be **J. M. Kirby,** chief geologist; **R. T. Wilson,** secretary and treasurer, and **W. H. McLaws,** legal counsel.

A. W. Cherry and **Barron Kidd,** operators formerly of Midland, Tex., and Illinois, now are calling Houston, Tex., home while drilling a deep test in southern Houston County, Texas.

Ben H. Gardner, chairman of the A.G.A. Industrial and Commercial Gas Section, is on leave from the Columbia Engineering Corp., of which he is vice president and is serving the Government as deputy director, Requirements Division, Surgeon General's Office.

R. E. Damp, general manager of Santa Rita Oil & Gas Co. and Northwest Refining Co., Cut Bank, Mont., two subsidiaries of Carter Oil Co., Tulsa, has been made a director of both concerns. **O. C. Schorp,** Tulsa, president of Carter, succeeds **L. F. McCollum** as president of the two Montana affiliates.

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FOR DRILLING DERRICKS
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TRAVELING BLOCKS, SWIVELS, ROTARIES

150, 250 and 350 ton roller bearing Crown Blocks as finely balanced as a good watch. Scientifically distributed load. Simple, rugged design. Alloy steel sheaves with flame hardened API line grooves. Minimum side pull, particularly when used with BREWSTER Traveling Blocks. See current Composite Catalog.

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Market Developments

East Coast

NEW YORK.—The oil supply situation on the East Coast continued to deteriorate with the approaching end of the season of heaviest consumption with the result that it has reached an all-year low. This condition is reflected in the A.P.I index which declined to 32.5 from 35.7 for the previous week, the sharpest drop since mid-December.

The deterioration affected all products including fuel oil, kerosene and gasoline. The decline in fuel-oil supplies was sufficient to again threaten the continued operation of war plants in the shortage area. Stocks of heating oil were at an all-time low.

The sharp decline in gasoline stocks was the most unexpected development. This draft on motor-fuel inventory was attributed to the relaxation of the enforced ban on pleasure driving and cast further doubt on the belief that restrictions will be lifted this spring.

Much of the difficulty was attributed to the low level of tank-car shipments which have been averaging less than 800,000 bbl. per day. In its last report, the PIWC economics group estimated March deliveries by rail at 880,000 bbl., 10 per cent greater than they have been.

Mid-Continent

RUMORS persisted in Mid-Continent refinery offices this week that the ban against shipment of motor fuel by tank cars from outside districts into District 1 (East Coast) will be lifted in the near future. Part of the current optimism in the refinery market is based on the possibility that gasoline trade with District 1 will be resumed in the fore part of the summer but even more satisfaction is found in the higher demand from agricultural districts and from the sustained, irreducible requirements in war-industry centers.

Numerous refiners in District 2 have not yet lowered their yields of gasoline in conformity with PAW instructions to produce no more than 70 per cent of their average output during the last half of 1941. Moral suasion is the only enforcement instrument used so far, but there is a possibility that more drastic action will be taken by PAW if current conditions persist.

Calls continued brisk for all grades of fuel oil, despite the approaching end of the burning season in north-central states. Prices are steady and unchanged at ceiling levels prescribed by OPA. Refiners are having no difficulty in obtaining the full ceiling prices for all fuels. The only difficulty is in satisfying shipping instructions from customers.

Natural gasoline is resisting normal depressing influences on the market at the end of winter. Limited quantities of unstabilized material may be moving at slight concessions but general tone of the market is steady.

Gulf Coast

HOUSTON, Tex. — Refiners of District 3 who hoped for relief in the transportation muddle express concern over the statement of Ralph K. Davies, deputy petroleum administrator, that there is no likelihood of substantial improvement before the second quarter of 1944. It is declared that some of the smaller operators will be forced to close their plants unless they succeed in developing new outlets for their products in nearby areas. In some cases manufacture of specialty products in certain seasons of the year may afford a measure of relief.

Railroad demand for heavy fuel oil has quickened in recent weeks. In this instance the transportation problem is virtually absent, since the railroads are able to provide the needed cars.

Although specific information is lacking, large quantities of No. 2 fuel oil are said to be in storage tanks at some points on the Gulf Coast, waiting for means of movement to the east and north. These stocks are understood to be in the hands of major refiners who are equipped to hold them until opportunity to move them by tank car or pipe line appears.

Tractor fuels, or such grades of motor fuel as are adapted for tractor use, are in rising demand in agricultural areas of the Southwest. The large refiners of this territory do not cater to that class of trade, and requirements are filled for the most part by relatively small plants situated within trucking distance of points of consumption. A few independent refiners in the Houston district ship tractor fuel to farm regions of the Southeast.

Inquiries for No. 6 fuel oil, desired for either domestic or Bunker C use, are reported, but facilities for delivery are so crippled that few refiners are quoting prices. One buyer seeking 100,000 gal. was said to be finding almost no sources of supply.

Kerosene continued to be the tightest item in the list of oil products. Not only is the transportation problem present there, but refiners say only small and scattered stocks are in existence anyway.

Natural gasoline was reported to be slightly easier.

A.P.I. REFINERY REPORT

Week Ended March 6, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Stocks: Residual	Stocks: Gas oil
Appalachian	154	2,892	532	726
Ind., Ill., Ky.	723	20,211	2,783	3,496
Okla., Kan., Mo.	360	7,517	1,427	1,528
Censored area*	1,638	38,342	9,649	14,515
Rockies	86	2,080	538	376
California	665	20,803	53,853	11,027
Total 3- 6-43	3,626	92,845	68,782	31,668
Total 2-27-43	3,709	93,157	70,140	32,939
Total 3- 7-42	3,520	108,997	86,669	32,742

Note: Refinery runs and stocks for week ended March 13, 1943, appear on Trends page, unless unavoidably delayed.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of PAW.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
March 6, 1943	235,686,000
February 27, 1943	235,217,000
March 7, 1942	260,084,000

*Excludes unrefinable California stocks.

Pacific Coast

LOS ANGELES, Calif.—There was no appreciable change in California markets during the past week and what little refined oil that moved was in a narrow range and at prices that have prevailed for several weeks. Gasoline continued weak in contrast with fuel and gas oil that have been strong and in good demand for several months.

The armed services have not taken as much gasoline and fuel oil as had been anticipated and consequently these products have been accumulating at refineries for the past several weeks. This is probably only a temporary condition, however, and as the usual demand continues the services are depleting their respective stocks.

In comparing military demand a long-term period must be observed because of irregularity and bottlenecks. Deliveries cannot always be taken as desired.

Some marketing companies that have been doing considerable business with the armed services temporarily find themselves with stocks piling up due to decreased liftings and may be forced to curtail refinery operation.

Refinery Prices

(Prices as of March 16)

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

REFINERY GASOLINE

Octane (A.S.T.M.):	†80	74-76	72-74	68-70	63-66
Mid-Continent*			5.875-6.000		5.500-5.625
Pennsylvania		6.750-7.000			
Gulf Coast‡	6.00-6.50		§5.750-6.250	§5.750-6.250	§5.250-5.750
Northeast Coast	9.50		9.2	9.2	
California		6.250-6.500	6.125-6.250	5.750-6.000	5.125-5.250

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

KEROSENE AND NO. 1 FUEL OIL

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*			4.500	4.375	
North Louisiana				4.500-4.750	
Pennsylvania	6.250-6.625	6.125-6.250			
California				4.500-5.500	4.250
Northeast Coast				6.80	
Gulf Coast				3.875	

*Basis Oklahoma Group 3.

TRACTOR, DIESEL, AND BUNKER FUEL OIL

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125					
California		2.750-4.000			‡$1.35-1.45	$0.85-0.90
Gulf Coast			4.000	4.125	1.45	0.85
Northeast Coast				6.800	2.780	1.65
North Louisiana						†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

FURNACE OIL, GAS OIL, FUEL OIL

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0		1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

NATURAL GASOLINE

Grades:	25-70	18-55
Oklahoma (Group 3)	3.575	4.650
North Texas	3.500	4.200
North Louisiana	3.625	4.350
California	4.875	5.500

LUBRICATING OILS

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash)

10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
650 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:	
200-3	15.00
250-3	18.00
300-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oils

CALIFORNIA—

Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25

GULF COAST—

Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:	
Zero pour point	37.50
10 pour point	36.50
15 pour point	35.50
25 pour point	30.00
200 vis. at 70° F., 3 color:	
Zero pour point	39.50
10 pour point	38.50
15 pour point	37.50
25 pour point	32.00

WAX

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250
NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND
(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Com-bined tax	Kero tank wag.
Baltimore, Md.	15.95	5.50	10.20
Boston, Mass.	14.90	4.50	9.80
Burlington, Vt.	16.90	5.50	10.10
Buffalo, N. Y.	16.20	5.50	10.60
Dover, Del.	16.70	5.50	12.00
Hartford, Conn.	15.60	4.50	9.70
Manchester, N. H.	17.30	5.50	10.80
Newark, N. J.	15.20	4.50	9.70
New York, N. Y.	16.10	5.50	9.80
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.90
Providence, R. I.	15.00	4.50	9.80
Washington, D. C.	15.20	4.50	11.00
Average 14 cities	16.02	5.14	10.49

(All prices undivided dealer basis.)

CENTRAL
(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co., and Texas Co.)

	Dealer tank wagon	Com-bined tax	Kero tank wag.
Chicago, Ill.	13.40	4.50	10.20
Cleveland, Ohio	15.60	5.50	*9.60
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.80
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.60
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.87	9.61

*Includes 1-cent state tax.

SOUTHEASTERN
(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Com-bined tax	Kero tank wag.
Atlanta, Ga.	18.90	7.80	*11.50
Birmingham, Ala.	18.50	6.50	9.00
Charleston, S. C.	18.95	7.80	....
Charleston, W. Va.	19.25	6.80	13.30
Charlotte, N. C.	20.10	7.50	11.30
Jacksonville, Fla.	18.90	5.80	9.50
Jackson, Miss.	17.50	7.50	‡9.00
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	17.90	8.50	10.50
New Orleans, La.	17.75	8.50	*10.00
Norfolk, Va.	17.45	6.50	12.00
Average 11 cities	18.34	7.50	10.46

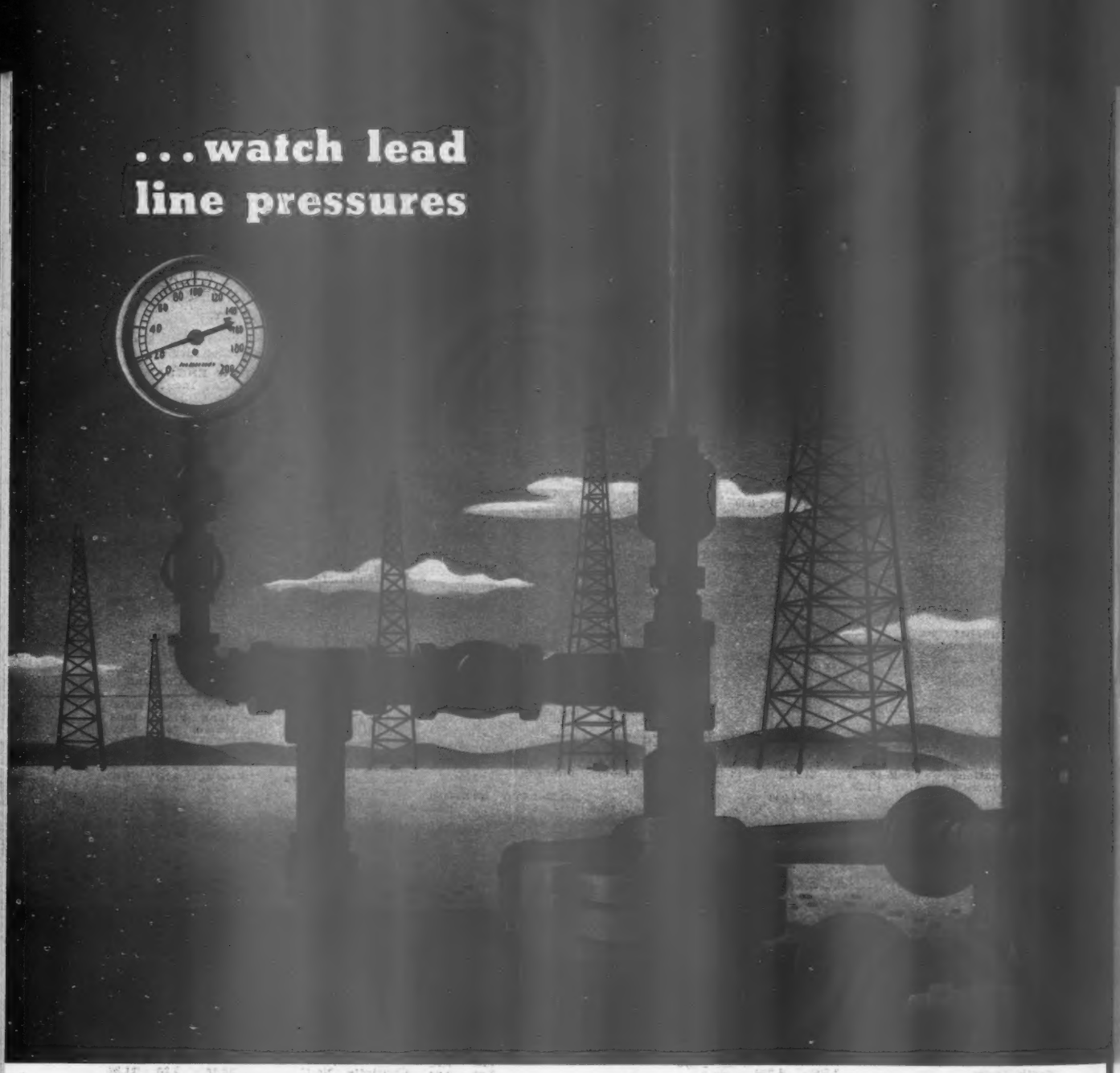
*Includes 1-cent state tax.
‡Includes ½-cent state tax.

MIDWESTERN
(Continental Oil Co.)

	Dealer tank wagon	Com-bined tax	Kero tank wag.
Albuquerque, N. M.	17.50	7.50	10.40
Boise, Idaho	20.10	6.50	16.30
Casper, Wyo.	17.00	5.50	13.80
Denver, Colo.	14.50	5.50	11.80
Helena, Mont.	17.00	6.50	13.80
Phoenix, Ariz.	18.50	6.50	13.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	13.88

PACIFIC COAST
(Standard Oil Co. of California)

	Dealer tank wagon	Com-bined tax	Kero tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.55	5.96	10.76



Under some circumstances it is desirable to maintain extra pressure on lead lines. One example is using it as a preventive against paraffin deposition. Generally, however, extra pressure causes lost production, and undue wear and damage to equipment.

Excess pressure may be due to stoppages caused by paraffin, sludge, or calcium or other deposits from entrapped water. Or the cause may be obstructions such as rags, gloves, gaskets, pump cups or rodents.

Whatever the cause, the results are evil. Stuffing box leaks, and replacements, increase in frequency. Tightening the stuffing box may result in scoring the polished rod. There may also be an increase in unnecessary oil slippage by the pump plunger, and overloading of the sucker rods and pump beam.

Equipping pumping wells with pressure gages mounted on the lead line is an excellent precaution. The normal pressure required can be accurately calculated by flow formulae, or it can be estimated to be the head, (0.4 times footage), plus 100 percent for friction loss.

Any rise above normal in pressure as shown by the gage can be immediately investigated and the cause removed. Thus possible damage to equipment, or loss of production will be prevented.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
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MOLY

Equipment Progress

Trade Papers "Backbone" Of Marmon-Herrington Advertising

Recognition of the important part of the trade press in promoting the security of postwar markets, as well as in the winning of the war is shown in the release of Marmon-Herrington contracts for advertising space in 1943.

This company, always a user of generous space in trade papers, is continuing its insertions in a wide list of publications this year, even though there are no Marmon-Herrington vehicles available except for military and most essential civilian services.

Asked to define Marmon-Herrington's policy concerning advertising in a period when the company has practically "nothing to sell," Bert Dingley, president, said that lack of actual sales contacts was all the more reason for advertising contacts, if the manufacturer hoped to return to markets left uncultivated during the war.

"As builders of highly specialized automotive equipment for extremely difficult services," said Mr. Dingley, "trade papers, supplemented by direct mail, have been the only advertising vehicles we could use intelligently to reach our prospects. Our all-wheel-drive trucks, commercial cars and passenger automobiles accomplish feats of transportation in certain industries and fields of service which are literally 'impossible' for any other type of vehicle. The very qualities which make Marmon-Herrington trucks so valuable in these specialized services preclude their economical use for ordinary transportation services. Therefore the use of general magazines for advertising purposes, under normal conditions, would be prohibitive to us on account of the tremendous waste circulation. Even publications like the general automotive magazines which represent a very specialized coverage for most advertisers, are a broad, general coverage for us."

Republic Supply Distributor In Southwest

Wolverine Tube Division of Calumet and Hecla Consolidated Copper Co., Detroit, Mich., announces the appointment of Republic Supply Co. as exclusive distributors for its tubular products in the Southwest.

Republic Supply, a subsidiary of Republic Steel Corp., has its general offices in Houston, Tex., and since its organization in 1910 has enlarged its scope of operations to include 36 branches and sales offices in Oklahoma, Arkansas, Louisiana, New Mexico, Indiana, Illinois and Kansas. The first four states named comprise the territory in which the company will represent Wolverine Tube Division.

Republic specializes in the sale and distribution of equipment for the producing and processing of petroleum, and the addition of a line of tubes for heat exchangers, coolers, condensers, etc., is an entirely logical move.

Badger Receives Army-Navy "E" Award

Brig. Gen. Leslie D. Groves, deputy chief of construction division, office, Chief of Engineers, Washington, D. C., presented the Army-Navy Award for excellence in war construction to the men and women of E. B. Badger & Sons Co. at the West Virginia Ordnance Works, Point Pleasant, W. Va., March 4.

E. B. Badger, president of the century-old Boston engineering firm which bears his name, replied to General Groves following the presentation of the Army-Navy "E" pennant. Individual "E" lapel pins were given to approximately 1,500 workers from West Virginia and nearby Ohio who now are employed on the project.

Trade Literature

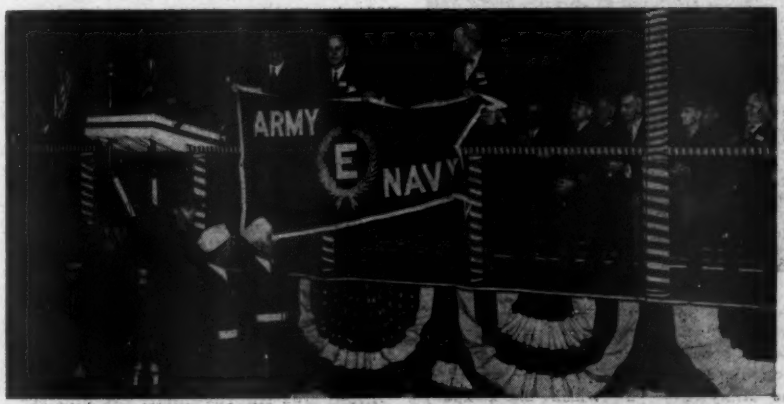
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.—Bulletin B-6211, describing Ro-Flo compressor and vacuum pumps. The bulletin makes the Ro-Flo and its operation simple to understand. A complete engineering description is supplemented by installation diagrams, curves showing the relationship between pressure, temperature, and volume, photographs and section views.

Permutit Co., 330 West Forty-second Street, New York, N. Y.—A booklet on ion exchangers for industrial purposes, which product the company has recently added to its line. Recent development of acid-regenerated cation exchangers and of suitable anion exchangers has widened the fields in which ion exchange materials may be used.

BABCOCK & WILCOX RECEIVES ARMY-NAVY "E"

The Army-Navy production award was presented to Babcock & Wilcox Tube Co. on February 4 at its Beaver Falls, Pa., plant. The award was made by Rear Adm. William C. Watts, U.S.N., retired, and was accepted for the company by A. G. Pratt, president. Lt.-Col. John S. Swauger, U.S.A., presented "E" pins to representative employes. Hon. Frank E. Reader, presiding judge, Beaver County, Pennsylvania, acted as master of ceremonies, while U. S. Senator James J. Davis made the opening remarks.

Production at the Beaver Falls plant has been trebled since Pearl Harbor, but the company has not failed to produce needed material on time. After paying tribute to this record, Admiral Watts concluded his speech by saying: "I appeal to you to look upon this Army-Navy "E" burgee as truly a battle flag under which you pledge yourselves to fight the good fight in the battle of production and to do your absolute best for your country, in all ways, in the time of its great need."

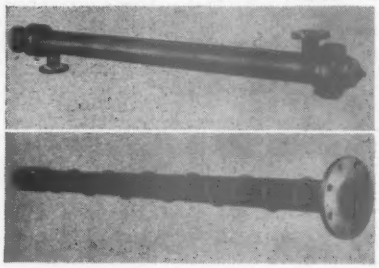


A. G. Pratt, president, and P. D. White, vice president and general manager of Babcock & Wilcox Tube Co., holding the "E" burgee. At Mr. Pratt's right is Rear Adm. William C. Watts, who made the presentation

Among Equipment Men

Standardized Design Shell And Finned Tube Heat Exchanger

The "Shellfin," a standardized heat exchanger suitable for most uses and built on a production basis, is a new



product of Downingtown Iron Works, Downingtown, Pa.

With only minor changes in its basic construction, such as baffle spacing and length combinations of units, the "Shellfin" can be used for many forms of heat exchange between two fluids in medium temperature ranges where temperature of one fluid materially exceeds that of the other. "Shellfin" adapts perfectly to cooling, heating, condensing and evaporating processes.

The standardized construction eliminates much usual preliminary engineering; having standardized performance and pressure curves, unit selection can be made easily. And, features and construction throughout have all the quality of the finest "custom-built" heat exchangers.

Lt. Gen. William S. Knudsen, chief of Army production and former president of General Motors, congratulating A. Olin Price, general manager of Brewster Co., on the award of the Army-Navy "E" which the company received several weeks ago. General Knudsen stopped to inspect the Brewster Co. on a recent trip.

Horner Joins Development Staff of Guiberson

John W. Horner, experimental research engineer, has joined the development staff of the Guiberson Diesel Engine Co., it is announced by W. E. Lind, director of research for the company, which is expanding its development of radial, air-cooled diesel engines for aircraft and other uses.

Mr. Horner, who is engaged in stroboscopic studies of valve gear, combustion phenomena and other phases of activity in the Guiberson single-cylinder laboratory, was formerly with Lawrance Engineering & Research Corp., Linden, N. J., where he had been engaged in research, and Chrysler Corp.

Roscoe R. Smith Appointed Durametallic Sales Manager

ROSCOE R. SMITH

Announcement has been received from C. C. Hall, executive vice president, Durametallic Corp., Kalamazoo, Mich., of the advancement of Roscoe R. Smith, formerly manager of the firm's Chicago sales office, to the position of sales manager and chief of field engineers.

Mr. Smith has been associated with Durametallic since 1928. He has been sales representative in the territories of western Michigan, Indiana, Ohio and Kentucky for the flexible metallic packings and sealing devices manufactured by this concern. He plans to make personal calls with Durametallic field engineers on plants and projects in the territories covered by the corporation.

American Meter Elects Klumpp Director

American Meter Co. announces the election of John B. Klumpp to its board of directors. Mr. Klumpp brings to the directorate experience gained in a long and distinguished career in the utility field, being recognized as one of the outstanding gas engineers in the country.

After graduating from Stevens Institute of Technology in 1894 with an M.E. degree, he was employed by United Gas Improvement Co. and remained with that organization in various engineering capacities until 1929, at which time he resigned to engage in private practice as a consulting engineer. During the many years he was associated with U.G.I., Mr. Klumpp was engaged in gas works design and construction and in the general operation of various U.G.I. gas and electric properties and on many special assignments.

Mr. Klumpp is a member of the Institution of Gas Engineers of Great Britain, and the American Society of Mechanical Engineers. He has been actively identified with the American Gas Association and its predecessors since 1907.

Cummins Appointed Diesel Consultant by WPB

C. L. Cummins, founder-president of Cummins Engine Co., Columbus, Ind., has been appointed executive consultant on diesel engine production to the War Production Board, with headquarters in Washington, D. C. The position carries the nominal dollar-a-year salary.

Appointment of Mr. Cummins to this newly created post is the direct outgrowth of a conference held recently in Washington at which time WPB officials made clear to executives of the principal diesel manufacturers the need for increased production and urged, as a step toward this end, the selection of a man from within their own ranks to undertake this important job.

In broad outline, it will be Mr. Cummins' duty to review the Army's and Navy's diesel engine requirements and allocate orders to fit plant capacities.

Mr. Cummins first became associated with the diesel engine industry during World War I when—functioning almost as a one-man plant—he built small "oil engines" for a mail-order company.

Goodrich Promotes Davies

John M. Davies, in the research division of B. F. Goodrich Co. since 1926, has been named director of physical research, it is announced by Dr. H. E. Fritz, company research director.

Mr. Davies is a graduate of University of Akron where he received his science degree. He also did graduate work at University of Chicago.

He was an instructor in physics at University of Akron before joining Goodrich as a physicist.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED RATE	DISPLAYED—PER INCH
8 CENTS A WORD, minimum charge $2 per insertion.	Classified display advertising set in single or double column style:
SITUATIONS WANTED. 4 cents a word, minimum charge $1.	1 inch ..... 1 time $7.00
BOX NUMBERS. count 9 words when replies are to be sent to our Tulsa Office.	1 inch ..... 13 times 6.50
10% DISCOUNT if 3 insertions are ordered at one time, with check accompanying order.	1 inch ..... 26 times 6.00
All classified advertising payable in advance.	1 inch ..... 39 times 5.50
	1 inch ..... 52 times 5.00
	Rates are governed by total space used within 12 months from date of first insertion. Credits are allowed when lower rates are earned.

FORMS CLOSE MONDAY NOON—PUBLISHED EACH THURSDAY

LEASES AND DRILLING BLOCKS

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma,
Louisiana and Illinois.
20 Years' Experience
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton
St. Louis, Mo.

NEW MEXICO
State Oil and Gas Leases
Forty acres and multiples thereof, in a new HoT spot. 23 oil companies own surrounding leases. Write for information. No obligation. HARRY S. WRIGHT, New Mexico State Lessee, Farmington, N. M.

WANTED TO PURCHASE developed producing oil properties in Kansas or West Texas. Prompt action. C. C. Harmon, Nowata, Okla.

The Trustee will sell at public auction at the office of E. M. Baker, Referee in Bankruptcy, 372 Federal Building, Dallas, Texas, at 11:30 A.M., Thursday, March 25th, 1943, the following property in fee less 1/16th mineral rights non-participating. 800 acres located in Wichita County, Texas, three miles south of Iowa Park, in J. McCool Survey of Palo Pinto County School Lands, Blocks One, Two and Ten.

For further details telephone E. M. Baker, Referee, Central 2516. Two hundred acres under lease producing from shallow wells.

E. M. BAKER
Referee in Bankruptcy

LEASES AND DRILLING BLOCKS

GOVERNMENT leasing OIL Reservation Lands to American citizens, limited filing each. Want several help file structure, developing area. Its opportunity, small expense. Box B-522, The Oil and Gas Journal, Tulsa, Okla.

STRUCTURE fully geologized, geophysical, cored, equipped rotary and cable. Contractor drafted. Want deal completion. S. W. Pressey, Pueblo, Colo.

WANT LARGE WILDCAT DRILLING BLOCKS. Texas, Louisiana, Arkansas, Oklahoma, New Mexico, Illinois; state proposition; location in detail, first letter. ATS, 1216 Ford Bldg., Detroit, Mich.

WILL GIVE 100 acres leases and complete well for $1200.00 on block acreage that has well with good showing of oil and lots of gas. This well is too high on structure. Next well should be drilled lower on structure. Production will be 700 feet. Very prolific sand. Box B-531, The Oil and Gas Journal, Tulsa, Okla.

A GOOD PLACE to invest a few dollars for future benefit: 40 acre new 10 year lease, Shelby County, Texas, ½ mile from production, $5 per acre. Also 10 acre and 25 acre lease, same location, $5 per acre each. Good looking buys. Write C. A. Parker, Box 451, Center, Texas.

DRILLING BLOCK: Approximately 8500 acres solid, Bastrop County, Texas, 10-year Commercial leases, 50c per acre annual rental. Balcone's Fault Area. Box 124, Bastrop, Texas.

160-ACRE LEASE available, Sec. 29 and 30, Township 10 North, Range 12 East, Okfuskee County, Oklahoma. Gas within one-quarter mile. Joseph Low, 150 W. 79th St., New York City.

PATENT ATTORNEYS

PATENTS, Trade-Marks. Booklet, "General Information Concerning Inventions and Patents" and "Free Schedule" sent without obligation. Established 1915. Lancaster, Allwine & Rommel, Suite 418, Bowen Bldg., Washington, D. C.

LEGAL BLANKS

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 318 East Third St., Tulsa, Okla.

HELP WANTED

WANTED: Draftsman for general refining drafting. Permanent position. Reply must state experience, education, age, draft status, expected salary, and references. Box B-511, The Oil and Gas Journal, Tulsa, Okla.

REFINERY MAINTENANCE ENGINEER
Man thoroughly familiar with machine shop practice, as well as all types of refinery mechanical equipment, including pumps, compressors, turbines, motors, boiler house equipment, etc. A graduate engineer who has served a machinist's or mechanic's apprenticeship is preferred. Position is of supervisory nature in engineering or maintenance department of middle size refinery in the Middle West. In reply, state draft status and salary required, as well as a complete outline of education and experience. Apply Box B-530, The Oil and Gas Journal, Tulsa, Okla.

WANTED—EXPERIENCED Engineers and designers for internationally known manufacturers of oil field drilling and servicing equipment, now working on war contracts. Permanent—full time—pleasant work. Salary discussed in personal interview. Cardwell Manufacturing Co., Box 2001, Wichita, Kansas.

WANTED: Chief Chemist for modern Midwest refinery beginning April 1st. Technical training necessary. Please give full particulars of training, education, and draft status. Box B-533, The Oil and Gas Journal, Tulsa, Okla.

PROCESS ENGINEERS
Graduate Chemical Engineers and Chemists. Prefer men with experience in refinery or gasoline plant on design or operation of light end equipment. Location, Mid-West. Permanent position. In reply state experience, education, age, draft status and salary expected. Box B-510, The Oil and Gas Journal, Tulsa, Okla.

NOTICE TO ADVERTISERS
Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:
"Applications from those now employed in war industries will not be considered."

SITUATIONS WANTED

EXECUTIVE ENGINEER, age 38, 20 years active experience sound organizations, refining and heavy chemical field. Well versed equipment, processes, engineering, estimating and construction. Desires contact management where this experience can be used. Box B-513, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Manager-Superintendent with 10 years experience all phases refining plus 10 years experience in all phases of management. Would be interested in managing small refinery on profit-sharing basis. Box B-514, The Oil and Gas Journal, Tulsa, Okla.

OIL ACCOUNTANT, soon available, desires permanent connection with independent operator. Actually experienced in accounting, office management, taxation, government regulations, etc., for production and drilling operations, corporation and individual. Box B-516, The Oil and Gas Journal, Tulsa, Okla.

BY production engineer experienced in gasoline plants, drilling, production, appraisals in Southwest with several years foreign service. Above draft age. Box B-520, The Oil and Gas Journal, Tulsa, Okla.

WYOMING OPERATOR 25 years experience developing, producing, marketing. Complete office, records, geology, etc. Will represent nonresident owners. No promotions. Box 1004, Casper, Wyoming.

JOB WANTED as skimming plant Supt., any sized plant most any locality, can make them talk in any language. Have had five years experience as Ass't. Supt. several years refinery construction with extra good engineers. Can take full charge of operation any sized plant, most any location, on two weeks notice. Can furnish good references to any party interested. Box B-532, The Oil and Gas Journal, Tulsa, Okla.

(Continued on Next Page)

CLASSIFIED ADVERTISING — EQUIPMENT FOR SALE

NEW COMPLETE CATALOG NOW AVAILABLE

- **LYNCH REFINERY, KILGORE, TEXAS**
- **TITAN REFINERY, STARK, MICH.**
- **TULSA WAREHOUSE STOCKS**

Completely Reconditioned Refinery Equipment

Valves and Fittings—Storage Tanks

Wire—Phone—Write for Your Copy Now

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry
Union Ave. at 21st Street

Robt. W. Duden
Tulsa, Oklahoma

FOR SALE—One partial list steam rotary equipment located near Coyle, Oklahoma, priced right to sell. Inquire T. T. Eason and Company, Enid, Okla.

COMPRESSORS—TANKS—FOR SALE
2—Bessemer type 6, direct driven engine and compressors, 80 hp., 180 r.p.m. Engine cylinder 16 x 20 and air cylinder 7 x 20. 2—Bessemer compressors same as above with air cylinder 14 x 20. 3—8,000 gallon capacity steel gasoline storage tanks, size 10'x13'x¼", riveted. Louisiana Iron & Supply Co., Longview, Texas.

FOR SALE at Seminole, Oklahoma, 6 Tulsa Type low pressure Gas Coolers. Cities Service Oil Company—Patridge, Bartlesville, Okla.

USED cranes, shovels, draglines, clamshells, graders, pumps, compressors, generators, gasoline and electric motors and other contractors equipment. L. A. ROUNTREE, 362 Pierce, Gary, Indiana.

1—100 H.P. 2 cylinder McEwen Oil Engine in excellent condition, horizontal stroke, speed 250 rpm. Write or wire Haxton Canning Company, Oakfield, New York.

STEEL BUILDING, 108' x 630' with crane. Several additional buildings from 44' x 64' up to 53' x 122'. INDUSTRIAL SUPPLY & EQUIPMENT CO., INC., Ra 0689-Ma 5586, Canal Building, New Orleans, La.

1-#2 NATIONAL DRILLING Machine, wooden mast. Call or write E. M. Howard, Rising Star, Texas.

FOR SALE, near Russell, Kansas, 1 Adams #10 steel Leaning Wheel Grader with tractor hitch. Cities Service Oil Company—Patridge, Bartlesville, Okla.

CLOSING OUT 50,000 ft. of good ⅞" sucker rods. 2½" to 8" Williams pipe threading machine, complete with dies. O. K. Pipe and Supply Co., 1110 S.E. 29th, Oklahoma City, Okla.

Second hand Oklahoma City alloyed sucker rods, ¾", ⅞" and 1".
Sucker Rods, Fishing Tools, Tubing Spiders, Tubing Catchers, all sizes.
Structural Steel and Reinforcing Rods.

M. R. TRAVIS
1702 S. Boulder Tulsa, Oklahoma.

DIESEL—GAS—ENGINES
Large selection—All sizes and types. **Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.**
Complete information on request.
A. G. SCHOONMAKER COMPANY
48 Church Street, New York, N. Y.

FOR SALE: Complete steam rotary drilling rig with 126 foot steel derrick and equipment located in Wyoming-Montana Field. Box B-505, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE, at Barnsdall, Oklahoma, one used 30"x30' 12-Tray Tulsa Type Absorber, 75# operating pressure. Cities Service Oil Company—Patridge, Bartlesville, Okla.

FOR SALE: At Hobbs, New Mexico—2—65 HP, 1—85 HP, LFB Boilers. Cities Service Oil, Patridge, Bartlesville, Okla.

2—120 HP, 650 RPM, rebuilt Diesel engines. power units.
1—200 HP, 514 RPM, completely rebuilt Diesel engine, power unit.
The two above can be supplied with Generators if desired.
2—66 HP Boilers.
1—75 HP variable speed A.C. Motor.
4—45 HP 950 RPM. new Atlas Imperial gas engines.
Also variable sizes small alternating current motors.

K. S. RICHARDS
P.O. Box 443 Fort Worth, Texas
Phone 3-5600

1—2 Reel Unit and Two-in-one Indicator and Measure Meter (Frank Mathey Machine Works Unit) Magazine and Body. Extra Magazine. 50—Copper Cans. 50—White Glycerin Can Covers. Approximately twenty shots have been run on this outfit. Ansberry Torpedo Co., Senecaville, Ohio.

7000 FEET 6⅝" O.D. Pittsburgh Special drill pipe, each joint equipped with Protin type tool joints. Excellent condition and only slightly used. Priced to sell.
6500 FEET 3½" O.D. Upset tubing—good condition (only used to gas lift oil) 35c per foot.
Four Oil Well 125 H.P. 350# W.P. boilers. Excellent condition. $2500 each.
HALL & BRISCOE, INC.
Oklahoma City, Oklahoma. Phone 7-4531

ONE COMPLETE steam rotary drilling rig with 4 Oil Well 125 HP 350# W.P. boilers —6500' 4½" O.D. drill pipe with tool joints. Rig ready to go and in good condition. Price $30,000. Hall & Briscoe, Inc., Oklahoma City, Oklahoma, Phone 7-4531.

1000—6" Style 38 Reconditioned Dresser Couplings with new Armored Gaskets. Utility and Industrial Supply Co., Jackson, Michigan.

FIRE TUBE BOILERS
(New or Used)
ONE WEEK'S DELIVERY AFTER RECEIPT OF ORDER
MOORE & COMPANY
1701 Nat'l Bank of Tulsa Bldg.
Tulsa, Oklahoma
Telephone 2-0058

5—7½"x20" Type V6, 800-lb. W. P. Clark Compressor Cylinders complete with clearance pockets. Call or write Cimarron Gasoline Corp., Box 248, Coyle, Okla.

FOR SALE—Bessemer Gas Engines, Compressors and repair parts. Vessels, towers, pumps, Chaplin Fulton regulators, Fisher liquid level controls, vacuum, pressure & temperature recorders, meters, valves, fittings, pipe and other miscellaneous material. GILBERT PIPE & SUPPLY, Electra, Texas.

1—11' Stroke Type J 51 Parkersburg Pumping Unit less Engine. 1—Type R Double Drum Cardwell Unit with Rotary and Spudder attachment with HXD Hercules Diesel Engine. 3—27½" Emsco and Union Tool Oil Bath Tables. 1—7¼ x 12 Gardner Denver Power Pump with Skids. Major Tool & Supply Co., Oklahoma City, Okla.

FOR SALE: Lufkin pumping unit suitable for 4000' well. Melton Supply Co., Seminole, Okla.

PUMP PARTS for Worthington, National Transit, Gardner-Denver steam pumps. Iverson Tool Company, Tulsa, Oklahoma, Phone 4-9127.

8000' Water line, 3" threaded, $0.24, location Coleman County;
2000' full-hole tool joints 4½" drill pipe, 30' joints, $0.75 per ft.; 3 single-cylinder **gas engines**, 25-30 hp. with reversible clutches, $175 each;
2 angle iron and 1 tubular 68 to 72' **STEEL DERRICKS** for pumping, $275 each. A. W. ADKISSON, W. T. Waggoner Bldg., Fort Worth, Texas.

HOT OIL PUMP FOR SALE
Used Worthington, Size 5⅛ x 18 gear drive, duplex with forged steel liquid end. Also available, 440 pieces new Admiralty Tubing, 1" O.D. x 2' long x 16 gauge. Subject prior sale. Write Box 2007, Tulsa, Okla., or Phone 2-7191, J. H. Naron.

Used Engines, and Compressors,
We Rebuild and Guarantee
L. F. SMITH CO.
217 W. Archer, Tulsa, Okla.

1—4" Shell 4' x 48' Forged Steel Reaction Chamber
1—⅛" Shell 5' x 74'—4000 barrel cap.—Crude Oil Fractionator with Trays.
120—Pieces 3" I. D.—3½" O. D.—30' long—Chrome Tubes.
30—Pieces 3½" I. D.—4" O. D.—21' to 28' long—Chrome Tubes.
162—3½" O. D.—6½" Centers—Chrome Key Headers.
30—Pumps, various sizes and types.
A. C. BAETSCH
BOX 127, FOREST PARK, ILLINOIS

HORIZONTAL STEEL TANKS
6—10 Ft. dia. by 30 Ft. Long.
2—10 Ft. dia. by 29 Ft. 6 In. Long.
2—9 Ft. dia. by 30 Ft. Long.
10 Above Tanks in Western Kansas.
3—4,000 Gal., 2—6,500 Gal.
2—10,000 Gal. in Ohio and Pennsylvania.

VERTICAL TANKS
29,000 Bbl. 90'6" x 25'6"
19,600 Bbl. 75' x 25'5"
2—7,500 Bbl. 44' x 26'
5,500 Bbl. 37'6" x 27'6"

R. C. STANHOPE, INC.
60 East 42nd St. New York, N. Y.

Classified Advertising

EQUIPMENT FOR SALE

FOR SALE—Approx. 6500 ft. 6⅝" OD 25.20# drill pipe with Reed Full Hole Shrink Grip Tool Joints, A-1 condition. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE: Two 250 hp. boilers, two stage air compressor 75 kw. ac. generator, ammonia condensers, receivers, pumps, hoists, motors, absorbers, generators, valves and fittings. Ten inch Taylor recording thermometer, Taylor anemometer and Sling psychrometer. Must dismantle immediately. Capital Ice Refrigerating Co., Indianapolis, Indiana.

DIESEL ENGINES
Large selection—all sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—also boilers, steam engines, turbo generators.
Complete information on request.
A. G. SCHOONMAKER COMPANY
50 Church St. New York, N. Y.
Phone—Worth 2-0455-6-7

FOR SALE: 6900' of ⅝" x 25' Axelson #60 Sucker Rods and couplings. Guaranteed good as new. Only used a few days and were never used for pumping. Located near Corpus Christi, Texas. Brauer Machine & Supply Co., Oklahoma City, Okla.

4—84" x 30' Ereco Absorbers, welded, 16 tray, ⅛" shell. 50# W.P. 1—72" x 59'2" Tulsa Type Absorber, riveted & welded, 28 trays, 9/32" shell. 75# W.P. 1—10,000 bbl. 12# Spheroid Gasoline Storage Tank, riveted. 1—80 H.P. Bessemer Type 10 Gas Engine Compressor, directed to 12" x 20" Compressor Cylinder C. J. Smith, Beacon Bldg., Tulsa, Okla.

FOR SALE: 30,000 barrel oil storage tank, condition perfect. F. H. Gregory, Pharr, Tex.

AIR COMPRESSORS, Graders, Road Rollers, Pneumatic Air Tools, other contractors Equipment and Refinery Equipment. Rent or sell. Falls City Sales Company, Box 776, Louisville, Kentucky.

FOR IMMEDIATE SHIPMENT FROM STOCK

125—20" Dresser Couplings complete with with Rubber Rings and Bolts, perfect condition.

50—30" Dresser Couplings complete with Rubber Rings and Bolts, perfect condition.

BROWN-STRAUSS CORPORATION
Box 78
Kansas City, Missouri

EQUIPMENT FOR SALE

FOR SALE—One complete steam rotary outfit less boilers, located near Coyle, Oklahoma, priced to sell. Inquire T. T. Eason and Company, Enid, Okla.

FOR SALE—BARGAIN: BOLTED TANKS 5000, 2250, and 1000 Barrel capacities, all first class condition. South Texas Pipe & Supply Co., Corpus Christi, Texas.

STEEL TANKS FOR SALE
220,000 Ga. Cap. 43 Ft. Dia. 20 Ft. High Riveted Construction.
2—12,000 Gal. & 1—6,500 Gal. R.R. Car Tanks.
L. M. STANHOPE
Wayne, Penna.

EQUIPMENT WANTED

WANTED: Well servicing units in good condition. All makes and sizes considered We pay cash. Melton Supply Co., Seminole, Okla.

WANTED: Duplex Steam Pumps any size and Deep Well Pumps. What do you have to offer? INDUSTRIAL SUPPLY & EQUIPMENT CO., INC., Canal Building, New Orleans, La.

WANTED: Truck load quantities, or more, of used small pipe, black and galvanized, ½", ¾", 1", 1¼" and 1½", shopped or unshopped. Advise price and location. CENTRAL PIPE & SUPPLY CO., 2611 Avenue H, Lubbock, Texas.

DIESEL ENGINES WANTED
1500 HP in one or more units with or without Generators. Single unit preferred. Give full information. Box B-418, The Oil and Gas Journal, Tulsa, Okla.

WANTED TO BUY: 36 L Bucyrus-Erie or Fort Worth Spudder. Quote price. George W. Miller, 706 Cherry St., Mt. Carmel, Ill.

WANTED
Abandoned Pipe Lines, in or out of the ground, Oil Wells, Steel Buildings and Steel Storage Tanks of all sizes.
JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards, St. Clair Co., Illinois.

WANT TO BUY
6—10,000 to 20,000 Bbl. Tanks or equal capacity suitable for gasoline.
V. BROOKE
60 East 42nd St., Tele. MU 2-3075
Rm. 1536, New York, N. Y.

EQUIPMENT WANTED

WANTED—Two 100 horsepower gas compressors. Keystone Pipe & Supply Co., 902 Burk Burnett Bldg., Fort Worth, Texas.

WANTED AT ONCE—DRILLING MACHINES—Prefer Spudders. Must be in first class condition and complete ready for operation. Fort Worth, Star, Cardwell or National. Two thousand to twenty-five hundred foot capacity required. State model and complete description, price and terms. Address R. L. Adkins, 909 Equitable Bldg., Denver, Colo.

WANTED: Complete plants to dismantle. Steel storage tanks. Steel buildings. Pipe lines and tank plates in any condition. NATIONAL STEEL & EQUIPMENT CO., 3800 Tulane Avenue, New Orleans, La.

ROYALTIES

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FINANCING

CAPITAL SEEKERS—Interested in raising $25,000 or more for a legitimate project should write to AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

INCORPORATION

DELAWARE CHARTERS: Powers broad, taxes low. Many of the largest corporations have Delaware charters. Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

RANCHES AND FARM LANDS

2000 ACRES IMPROVED livestock farm, Choctaw County, Oklahoma. On Federal Highway. Abundant water, pasture, meadow, timber, and arable land. Excellent building sites. J. J. Thomas, Seward, Nebraska.

Gravity Schedules

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas	West Texas*
18-18.9	$0.80			
19-19.9	.84		$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9		1.07	1.30	.94
32-32.9		1.09	1.32	.96
33-33.9		1.11	1.34	.98
34-34.9		1.13	1.36	1.00
35-35.9		1.15	1.38	1.02
36-36.9		1.17	1.40	1.04
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American Meter Company 20
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B & W, Inc. 106
Baash-Ross Tool Company 83
Baldwin Hill Co. 70
Baroid Sales Division, National Lead Company 49
Bethlehem Steel Co. 1
Brewster Company, The 111
Brown & Brown, Inc. 84
Bruning, Charles, Co., Inc. 85
Buckeye Traction Ditcher Co. 86
Buda Co., The 2
Bullard Co., E. D. 100
Cameron Iron Works, Inc. 91
Cardwell Mfg. Co., Inc. 4
Caterpillar Tractor Co. 13
Chain Belt Co. 14
Chemical Process Co., Inc., The 76
Classified Advertising 117-118-119
Climax Molybdenum Company 114
Cooper, Fred E. 98
Cummins Engine Co. 71
Dresser Mfg. Co., The 10
Eastman Oil Well Survey Co. 95
Edwards Co., E. H. 15
Electroweld Steel Co. 58
Ensign Carburetor Company, Ltd. 110
Franks Mfg. Co. 17
General American Transportation Corporation—Plate & Welding Div. 76
General Electric Company 19
Geophysical Service, Inc. 22
Hughes Tool Co. ..... Front Cover
Independent Exploration Company 88
International Harvester Co. 74
Jeffrey Mfg. Co. 106
Jensen Brothers Manufacturing Co. 76
Justrite Mfg. Co. 119
Lane-Wells Company ..... Inside Front Cover
Lucey Boiler & Mfg. Co. 57
Lufkin Foundry Co. 108
McCord Radiator & Mfg. Co. 87
Macwhyte Co. 3
Magnet Cove Barium Corp. 82-83
Martin-Decker Corp. 107
National Supply Co., The 50-51
Everstick Anchor Co. 84
Foreman, C. S. 86
Oakite Products, Inc. 16
Parid 64
Pipe Line Service Corp. 88
Preformed Wire Rope Div. 12
R-S Products Corp. 72
Reading-Pratt & Cady Division of American Chain & Cable Co. 6
Rector Well Equipment Co., Inc. 107
Reed Roller Bit Company 78
Seismic Exploration 88-D
Seismograph Service Corp. 88-A
Smith, H. C., Oil Tool Co. 107
Spang & Company 59
Sullivan Machinery Co. 46-47
Taylor Foundry Co., Inc. 16
Templeton, Kenly & Co. 106
Timken-Detroit Axle Co. 11
Timken Roller Bearing Company 54
Twin Disc Clutch Co. 8
Union Asbestos & Mfg. Co. 18
Union Wire Rope Corporation 9
Universal Oil Products Co. 45
Westinghouse Electric & Mfg. Co. 60-61
Wheatley Bros. Pumps & Valves 87
Wickwire Spencer Steel Company 66
Wilson Manufacturing Co., Inc. 7
Youngstown Sheet & Tube Co. ..... Inside Back Cover

Journalisms:

IN the Annual Refinery Number, appearing next week, attention has been focused on problems which the refiners face as result of war emergency conditions. Replacement of equipment for nonessential operations is well-nigh impossible; "patch 'em up and make 'em last" is less of a slogan than a necessity. New ways of applying cracking, filtration, control principles to wartime operations will be presented in that issue.

REFINERS, alive to their situation and full of determination, tell how they rebuild equipment to meet new needs. A more exact system of automatic control is being applied to operation of new, vital processes where old control methods have become inadequate. Technologists show how engineering, operating plans and methods, oftentimes worked out by engineering specialists in the past for the refiner, may be carried out by the refiner's engineers to supplement the work of those hard driven by war demands.

REFINING operations nowadays are divided into two classes—the "musts" and the "shoulds." The refiner must produce war products indispensable to the successful prosecution of the war; he should produce materials needed for his customers to the extent of their essential requirements. For the "must" products new equipment may be had under priority, eventually will be received. For the "should" products he generally must get along with what he has and can repair, rebuild, nurse along to do the required job.

MAINTENANCE of available equipment, repair of worn materials and their refitting for the same job or another where they may be needed is a primary prerequisite to good refinery management now. In the Annual Refinery Number appearing next week every practicable idea and suggestion for doing these things has been assembled, along with new methods for meeting emergency problems and new uses for old methods. Building a whole fractionator from scrap, a tank truck from parts of other trucks, are some of the ideas mentioned.

A FEATURE of the Refinery Number will be an expanded Buyers' Guide showing where every item of refinery equipment is manufactured. Previous printings of this feature have proved of great interest and war conditions make it even more valuable. Reprints are being prepared for distribution to key refinery personnel.

CALENDAR

March

OKLAHOMA UTILITIES ASSOCIATION, conference for executives and department heads, Tulsa Hotel, Tulsa, March 22.

AMERICAN PETROLEUM INSTITUTE, spring meeting, Division of Production, Pacific Coast District, Biltmore Bowl, Los Angeles, Calif., March 23.

April

INTERSTATE OIL COMPACT COMMISSION, quarterly meeting, Wichita, Kans., April 2-3.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, annual meeting, Texas Hotel, Fort Worth, Tex., April 7-9.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 8-9, 1943.

AMERICAN CHEMICAL SOCIETY 105th annual meeting, Detroit, Mich., April 12-16.

NATURAL GASOLINE ASSOCIATION OF AMERICA, twenty-second annual meeting, Baker Hotel, Dallas, Tex., April 14-16.

NATURAL GAS MANAGEMENT CONFERENCE, under auspices of Natural Gas Section, American Gas Association, Gibson Hotel, Cincinnati, Ohio, April 28.

AMERICAN PETROLEUM INSTITUTE, DIVISION OF PRODUCTION, Southwestern District, Rice Hotel, Houston, Tex., April 29-30.